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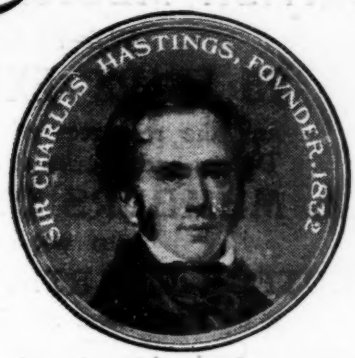

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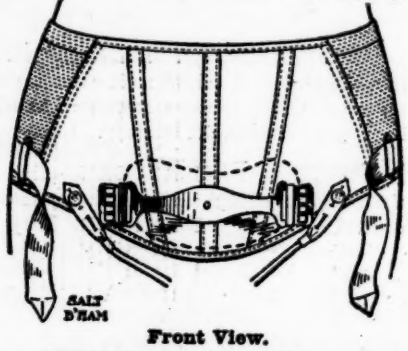

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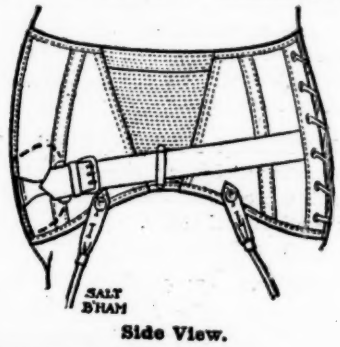

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The Bradshaw Lecture
ON
MELANOSIS
(MELANIN: MELANOMA: MELANOTIC CANCER).

DELIVERED BEFORE

THE ROYAL COLLEGE OF SURGEONS ON NOVEMBER 8TH,

BY

W. G. SPENCER, O.B.E., M.S., F.R.C.S.,
SURGEON TO WESTMINSTER HOSPITAL.

(With Special Plate.)

THE subject of this lecture, Melanosis, in some of its aspects has engaged the attention of former lecturers and of contributors to the Museum of the College.

I propose to relate briefly some recent observations from which there has been obtained an increase of knowledge as well as indications of the lines along which further research is desirable.

Some races of mankind have developed a pigment, melanin, which together with a free secretion from the skin serves to protect the central nervous system against the effects of excess of sunlight, and enables such races to work under the sun in the tropics, because the pigment prevents injury from the ultra-violet light rays. Races inhabiting colder regions, with much less pigment in the skin, have scattered collections of pigmented cells—melanomas. These have the characteristics of "congenital rests," which, although they show no outward change, yet as life goes on undergo an insidious degeneration. Without any sharp line of demarcation the degeneration may pass to the formation of a new growth—melanotic cancer.

Subject to individual differences this malignant change tends to arise in the later periods of life. In horses which turn white with age melanotic cancer supervenes with increasing frequency the longer the animal lives. In man melanotic cancer is a relatively rare form, but it has the peculiarity that two factors are associated—a proliferation of cells and a multiplication of the melanin pigment. The degeneration of the "congenital rest" into melanotic cancer cannot be prevented, nor the further course of the disease controlled. Once the malignant change has started, even although there is no clinical manifestation of it, a metastasis sets in forthwith. The secondary growths, however, displace rather than infiltrate, so that the metastasis may not become apparent for a long while. In addition to those on the surface there are collections of pigmented cells scattered in deeper structures which may be likewise regarded as "congenital rests." Through various causes, moreover, pigmented patches may be acquired which also may tend to undergo malignant degeneration.

Recent chemical observations have overcome to a large extent the difficulties concerning the analysis of melanin. A colourless melanogen by oxidation becomes a coloured melanin and is closely allied in composition to adrenaline. Both are connected with other protein derivatives which have the same feature—that of changing into coloured substances as the result of oxidation. Used as histological stains some of these serve to demonstrate the presence of melanogen in epithelial cells by converting it into melanin. Again, substances contained in coal tar, allied to those derived from proteins, when introduced into animals cause melanin to form, as well as giving rise to cancer.

Concerning the history of melanosis I limit myself to noting some of the contributors to the Museum and former lecturers.

Hunter examined the skin of a negro by macerating it, and found that it separated into three layers—corneous, mucous, and fibrous; the pigment was situated in the mucous layer, which rapidly liquefied and the pigment then collected as a sediment. The skin on the dorsum of the negro's foot was deeply pigmented, that on the sole hardly pigmented at all. The same layer in the skin of a white boy became pigmented after exposure to the sun. Hunter removed a melanotic tumour from below the jaw; such tumours were then included with those styled "fungus haematodes," as in the Museum specimen by Langstaff in 1812. Hunter was the first after Aristotle to advance knowledge concerning the Cephalopoda. The oldest of his specimens, still preserved, is the part of a huge calamary which Banks and Solander picked up off Cape Horn on Cook's first voyage. Hunter's observations included the discovery of the organ of hearing, and his collection supplied Owen with material for his classical descriptions.

William Lawrence, in 1818, in his lectures on physiology, zoology, and the natural history of man, described the varieties of the coloured races of mankind and aimed to put forward a rational view of the coloration of the negro. The negro was then held to rest under a primaeval curse, and the lecturer raised a storm of prejudice. Lawrence is now regarded as one of the founders of anthropology, and his lectures as a mine of carefully collected facts. Darwin completed the explanation. He said in his *Descent of Man*:

> "Hence it occurred to me that negroes and other dark races might have acquired their dark tints by the darker individuals escaping during a long series of generations from the deadly influence of the miasmas of their native countries."

Darwin gave to the Museum the painting of the piebald negro boy from South America; Everard Home that of the albino tiger. Jonathan Hutchinson a number of illustrations of leprosis, vitiligo, and partial albinism. The important *Monograph on Albinism in Man* by Pearson, Nettleship, and Usher, reproduced these and other illustrations in the Museum, and the monograph includes references to much of the subject of this lecture up to 1911.[1]

Following Hunter, the occurrence of melanotic tumours began to be noted by veterinary surgeons; the earliest illustration in the Library, that by Noack in 1820, exhibits melanotic disease in the ano-genital region of a grey mare (Fig. 11). In the same year Fawdington published a coloured lithograph representing melanotic growths in man. In 1847 Haycock described internal tumours in a horse. The classical description of melanotic cancer was given by Paget in his lectures between 1847 and 1852; it was based on specimens still preserved in the Museum and in that of St. Bartholomew's Hospital. The Museum also contains important illustrations by Jonathan Hutchinson besides those already mentioned—for example, drawings of melanotic whitlow, of the unequal distribution of pigment in melanotic growths, and of the senile freckles which may become malignant.[2] Chimney-sweeps' cancer attracted the attention of English surgeons from Percival Pott to Butlin, who devoted three lectures to the subject in 1892. Since then there have come researches relating to the influence of gas-tar products, both as regards pigment formation and the production of cancer in mice. Mr. Sampson Handley, in a Hunterian lecture in 1907, described the spread of the melanotic pigment from the new growth to the surrounding tissues, and along lymphatics to lymphatic glands.

THE ORIGIN OF MELANIN PIGMENTED CELLS FROM EPIDERMIS.

The epidermal origin of the melanin pigment and of the pigmented cells admits of demonstration in several ways, as well as the transference of such cells from the epidermis into the dermis and deeper tissues. On the other hand, that cells definitely mesoblastic in origin can form pigment so long as no malignant change has set in is not demonstrable, the property of the non-cancerous mesoblastic cell being limited to the taking in of melanin pigment by the cells acting as phagocytes. When melanotic cancer has once started, then the mesoblastic cells take part in it, so much so that the structure of secondary growths resembles sarcoma.

The Formation of Melanin Pigment in the Cytoplasm of the Epithelial Cells lining the Ink-sac of a Cuttle-fish.

The formation of melanin pigment in the cytoplasm of epithelial cells occurs in the ink-sac of Sepia.[3] It is a process which was evolved in palaeozoic times; Belemnites, mesozoic relations of Sepia, had an ink-sac measuring up to a foot in length. The remains of the Cephalopoda and of the great lizards which fed upon them are found in strata between the coal measures and the chalk. The Museum specimens were found crushed flat in the Oxford clay at Christian Malford and were described by Owen. His description includes that of the ink-sac, the muscular

fibres, and a drawing of a Belemnite restored. In one specimen the eight uncinate arms are preserved (Fig. 1). The dried black pigment was proved to be identical with the ink of Sepia by Francis Chantrey. After triturating and dissolving it he made a sepia drawing which a distinguished painter pronounced to be tinted with Italian sepia of the best quality.

In Sepia the ink-sac is a diverticulum from the rectum, the fluid being discharged, however, towards the head. There is an orifice, duct, collecting sac or reservoir, and a loculated fundus formed by infolding of the sac walls where the ink is secreted. Mr. Burne has kindly given me stained sections which exhibit the epithelial lining, the cells, and pigment in all stages of formation as follows (Figs. 2 and 3).

(*a*) Columnar epithelium rests on a basement membrane; the cells have oval nuclei, with one or more nucleoli, many of which are dividing, surrounded by an alveolar arrangement of the cytoplasm. (*b*) The nuclei are in the deeper part of the cell; in the cytoplasm around the nuclei are dark dots which tend to lengthen out into rods, arranged perpendicular to the basement membrane. (*c*) The superficial ends of the rods have broken off into dark granules or have run together into black droplets, which occupy the superficial portion of the cell. Unpigmented cytoplasm having an alveolar arrangement surrounds the nucleus in the deeper part of the cell. (*d*) The superficial portion of the cell has become distended with pigment; it disintegrates on the surface like goblet cells of the intestine, and the liberated pigment mixed with mucus collects in the reservoir. The inky fluid is highly diffusible so that it affords the maximum amount of obscurity around the animal. An octopus being repeatedly irritated, at first ejects inky fluid, then fluid less black, until finally the fluid discharged is quite colourless. The fluid has also poisonous properties—a lobster turns on its back, helpless to resist.

Pigmented Cells Produced in the Epidermis Passing Down into the Dermis and Deeper Tissues.

In embryo frogs branched pigmented cells develop in the epidermis and pass downwards into subepithelial tissues.[4] The ova of frogs are at first unpigmented, then granules of melanin appear in the cytoplasm and serve to protect against the harmful effects of sunlight whilst the ova are floating in the water; for frog embryos at the time of the closure of the neural tube have been killed by exposing them to ultra-violet light rays.[5] Exposure short of a lethal dose causes the rayed epidermis to increase in thickness and multiplies the amount of pigment in the deepest layer of cells. At this stage the epidermis of the back of a tree-frog embryo exhibits numerous branched cells containing pigment, whilst under the epidermis there are no pigmented cells at all. At the next stage the branched pigmented cells push down processes through the basement membrane into the dermis (Fig. 4). The body of the cell with its nucleus follows, so that there is then a bridge between the epidermis and dermis (Fig. 5). Subsequently pigmented cells are to be seen lying in the dermis with a process stretching up into the epidermis. Finally all the pigmented cells may be found beneath the epidermis (Fig. 6).

The Formation of Melanin Pigment in the Eyeball.

Melanin pigment begins to appear in the epithelial cells forming the outer layer of the optic cup in the embryo chick at the forty-second hour of incubation, in the fourth month of the human foetus. Particles of pigment arise within the cells distinct from the nuclei; at first grey, the particles become black and rather rod-shaped. The pigmentation begins in the equatorial zone of the future eyeball and spreads forwards more rapidly than backwards. There is formed a single layer of hexagonal pigmented cells, lying external to the rods and cones, with numerous processes into which pigment particles pass as the processes stretch down between the rods and cones. About the eleventh day in the incubated chick, in the seventh month of the human foetus, pigmented cells are found alongside the blood vessels of the choroid which has developed from mesoblast. The anterior margin of the retinal pigmented epithelium grows forwards beyond the ora serrata to furnish the pigmented cells of the uveal layer of the ciliary bodies and iris. The full pigmentation of the posterior layer of the iris is not complete at birth.

Scattered Foci of Melanin-pigmented Cells in Deep Tissues.

The pigmented cells of the epidermis and of the eyeball serve a useful purpose; no useful purpose has been assigned to collections of pigmented cells scattered among internal structures.

It may be explained that scattered foci of pigmented cells have reached their position during embryonic development.[6] Embryos of fish such as larval eels are at first transparent and pigment can be seen to develop in the eye and epidermis whilst the blood is still colourless. Embryos of bony fish in which the cartilage has been stained to contrast with the melanin pigment serve to demonstrate that pigment cells spread out from around the neural groove and canal in accordance with the segmentation into the metameres (Fig. 7). There is a primitive arrangement of pigmented cells on the surface along dorsal, ventral, and lateral lines and into the radiations of the fins. Sections through such embryonic fish exhibit deeper collections of pigmented cells, also corresponding to the metameric divisions. Stripes, patches, and markings on the coats of higher animals suggest a connexion with the primitive vertebral segments of the embryo.

It seems, therefore, a rational explanation that melanin pigmented cells, whether superficial or deep, have primarily developed around the neural tube, originally for the protection of the central nervous system. The pigmented cells have spread first into the epiderm, then deeper into the mesoblast of the immediate neighbourhood, and further have been carried away in the parietal and visceral layers of mesoblast along with outgrowing nerves, especially sympathetic nerves. Upon this the following classification is based.

A. *Skin.*—(1) *Epidermis:* Melanin pigment in the cells of the rete Malpighii, to a less extent in those of the rete spinosum, in the corresponding epithelial cells which produce shafts of the hair, also in the dendritic cells of Langerhans lying between the foregoing. The pigmentation of the epidermis varies from a deep black on exposed surfaces of the negro, to be hardly perceptible on most of the skin of blond races when not exposed to sunlight. Yet white races always show considerable pigmentation in the ano-genital skin and the areolae of the nipples.

(2) *Dermis:* Pigmented cells with branched processes occur singly, in scattered groups, in patches and sheets. Some lie close under the epidermis, some adjacent to the subcutaneous tissue. They originate as dendritic cells which have penetrated from the epidermis downwards into the dermis, whether already pigmented melanophores, or as colourless melanoblasts which become pigmented in the dermis. The mesoblastic cells of the dermis, as distinguished from cells of epidermal origin, have phagocytic properties and take up pigment freed by the breaking down of epidermal cells. The pigment may be so finely divided as to appear merely a dusky stain, or in the form of granules which pass from the epidermis along lymphatic channels. In lower animals the pigmented cells of the dermis serve a useful purpose in addition to the protection against excess of sunlight—colour is changed voluntarily and reflexly, in mimicry of surroundings; colour serves to differentiate species, and to distinguish sex during the breeding season. The subepidermal pigment cells are closely connected with radiating muscular fibres and nerve fibres, and under the control of the central nervous system, through sympathetic nerve fibres, cause changes in colour: on the one hand pigment granules collect in the body of the cell; on the other hand the pigment spreads out into the cell processes, the action being similar to that of the cells of the retinal epithelium covering the rods and cones. The differences in colour are partly due to the circulation of blood and to the varying translucency of the overlying skin; hence the change of colour in the dying and dead fish. Whatever the useful purposes served by pigmented cells in the dermis of animals, in human beings the scattered remnants are of no use. Groups of pigmented cells are found deep in the skin, especially of the back in the sacral region. This is the case to a small extent in blond races, but is much more marked among Mongolian, Eastern Asiatic, and Mediterranean races. Infants for some time after birth exhibit bluish, violet, or mulberry-coloured patches, scattered over the sacrum, buttocks, or even the shoulders. There may even be stripes reminiscent of vertebral segmentation. The patches are bluish rather than black, although the pigment in the cells is melanin. This is an optical effect of the semi-translucent overlying skin, as when tattooing is done with indian ink. As the skin thickens after birth the patches gradually become invisible, generally before 2 years of age.[7 8]

B. *The Eyeball.*—When fragments taken from the retinal pigment epithelium of an embryo chick are added to a cultivation *in vitro* of small pieces of living tissue, cells are seen to ingest granules of pigment.[9] This tends to show that the pigmented cells found outside the limits of the structures formed by the retinal pigment epithelium—namely, in the choroid and ciliary processes—may be derived from one of two sources: epithelial cells may have grown outwards from the original retinal pigment layer, or mesoblastic cells, fibroblasts, acting as phagocytes, may have ingested the pigment. In darker races scattered groups of pigmented cells are met with in the ciliary muscle, in the sclerotic, in the ocular conjunctiva, with much individual variation. In sheep in particular pigmented cells are carried along with ingrowing nerve fibrils into the limbus of the cornea.

C. *Collections of Pigmented Cells around the Central Nervous System.*—Patches of pigment occur scattered in the pia mater about the base of the brain and on the cervical and lumbar spinal cord. The condition is more noticeable in some animals, such as sheep; the brain of the crocodile in the Museum is enclosed by a dark sheet of pia mater. Symmers[10] noted in the course of *post-mortem* examinations of modern Egyptians a particularly well marked pigmentation of the pia mater. Melanin pigment is regularly present in the olfactory epithelium and in that of the labyrinth.

D. *Perineural, Perivascular, and Pericoelomic Groups of Pigmented Cells.*—These are found in the course of nerves, in nerve ganglia, in the wall of the heart and large blood vessels, in retroperitoneal and mesenteric connective tissue. In calves slaughtered for veal scattered pigmentation in the lungs, liver, along the trachea and oesophagus, in retroperitoneal tissue, along the sheaths of the sciatic and crural nerves, has attracted attention in the course of meat inspection. In full-grown cattle this becomes much less marked,[11] whether obscured by the thickening of tissues or because removed by absorption. In sheep melanin pigmentation is marked in periarterial and perineural tissues, in the endocardium and inner coat of the large arteries.[12] In the developing chick pigment is carried from the feathered areas inwards as far as the periosteum.

Chemical Formation of Melanin.

Note on the Chemical Relationships of Melanin.

The following formulae indicate possible steps by which melanin is formed.

(Revised by H. Wilson Hake, Ph.D.)

Methylamine	$NH_2—CH_3$
Ethylmethylamine	$CH_3—CH_2—NH—CH_3$
Ethylomethylamine	$CH_2OH—CH_2—NH—CH_3$
Propionic acid	$CH_3—CH_2—COOH$
Hydroxypropionic or ethylidenelactic acid	$CH_3—CH.OH—COOH$
Aminopropionic acid or alanine ...	$CH_3—CH.NH_2—COOH$
Hydroxyaminopropionic acid or serine	$CH_2OH—CH.NH_2—COOH$
Thioaminopropionic acid or cystein...	$CH_2SH—CH.NH_2—COOH$
Disulphide of cystein or cystin ...	$CH_2—S—CH\ NH_2—COOH$ $CH_2—S—CH\ NH_2—COOH$
Phenol	C_6H_5OH
Catechol or pyrocatechin, and hydroquinone	$C_6H_4(OH)_2$
Tyrosin or hydroxyphenylalanine ...	$OH.C_6H_4—CH_2—CH\ NH_2—COOH$
"Dopa" or dihydroxyphenylalanine	$(OH)_2C_6H_3—CH_2—CH.NH_2 COOH$
Adrenaline or dihydroxyphenylethylomethylamine	$(OH)_2C_6H_3—CH.OH—CH_2—NH.CH_3$
Pyrrole	C_4H_4NH NH HC CH HC— CH
Indole or benzopyrrole	
Skatole or methylated indole	
Tryptophane or indole alanine	
Tyrian purple—dibromindigo	

The Formation of Melanin from a Colourless Mother Substance—Melanogen.

Melanin is obtained: (1) by macerating the skin of a negro—the total amount in the whole of the skin has been estimated not to exceed 1 gram; (2) from the ink of a cuttle-fish; (3) from a melanotic tumour. From whichever source there seems to be no essential difference in the melanin. In the course of analysis of melanotic fluid two portions may be distinguished—a sulphur-containing portion, and a portion blackened by oxidation. The amount of sulphur has been estimated to vary from 5 to 12 per cent., whereas in the original protein molecule the amount of sulphur does not exceed 2 per cent. In the living epidermis most of the sulphur is found in the keratin of the corneous layers, in the hair and feathers. In the breaking up of protein molecules the sulphur mostly passes into cystein and cystin. Freed from all traces of blood, melanin does not give the reaction for iron and the blood pigment has no part in its formation.

The idea of a colourless mother substance, melanogen, which becomes by oxidation melanin, originated with the discovery of Thormählen that the urine of patients suffering from secondary melanotic cancer of the liver turned dark on oxidation. The process occurs under simple exposure to the air, but is intensified by treating the urine with oxidizing agents.[56] Further researches have shown that melanogen is present in the basal layer of the cells of the epidermis, also in the epithelial cells of the hair follicles by which hair is formed, including the dendritic cells lying between.

Fresh pieces of dead skin, also sections of fresh skin cut by a freezing microtome, darken when kept for some days in an incubator. The darkening is much more rapid when the pieces or sections are exposed to ultra-violet light rays. Pieces of skin or sections made as above from brunettes or patients dead of Addison's disease are still further darkened. The same happens in dog's skin already darkened by removal of the adrenals. On microscopic examination this darkening is seen to be the result of the formation of granules of melanin pigment in the epithelial cells. Darkening by the formation of melanin from melanogen is also produced by chemical reagents. Solutions of tyrosin and of adrenaline act weakly; a much more active reagent was discovered by Bruno Bloch, professor of dermatology in Zürich;[13] it is nearly allied in composition to tyrosin. He named it for short "dopa," and obtained it from embryos of the broad bean. Fresh skin and sections cut with a freezing microtome treated with a 1 pro mille solution of "dopa" take on a smoky grey stain which deepens by the formation of brown and black granules (Fig. 8). The process is one of oxidation which is prevented by an atmosphere of nitrogen; it is favoured by warmth in an incubator, but inhibited by overheating. The darkening is restricted to the epithelial cells in the basal layer of the epidermis and to the cells forming the hair. The dendritic cells are best demonstrated in horizontal and oblique sections, when both the cells and their processes are seen to be deeply stained by the "dopa" solution (Fig. 9). The density of staining varies from cell to cell, and there are individual variations in accordance with the natural colour of the skin. The "dopa" reaction further serves to show that melanogen is absent from patches of leucoderma or vitiligo and from the skin of albinos; skin from such sources when treated with "dopa" solution fails to stain; neither the cells of the rete Malpighii nor of the hair follicles become darkened.

In the human foetus the "dopa" reaction is yielded by the cells of the epidermis and hair follicles before any appearance of pigment. The embryonic cells of the retinal epithelium before the commencement of the formation of pigment—that is, before the fourth month in the human foetus—are likewise stained by the "dopa" solution. On the other hand, pigmented cells in the choroid as well as those in the dermis are not further darkened by the "dopa" solution which tends to indicate in them the absence of melanogen, and that these connective tissue cells of mesoblastic origin are not melanoblasts, but merely melanophores. When melanin is injected subcutaneously such connective tissue cells take up melanin by a process of phagocytosis.

The cells in a pigmented naevus are deeply stained by the "dopa" solution, but so long as no malignant change has set in connective tissue cells are not affected (Fig. 10). When, however, melanotic cancer has supervened then there is a staining by "dopa," not only of epithelial but also of connective tissue, including endothelial cells. This may be taken to indicate that with the setting in of the malignant process there is a production of melanogen to excess.

Bloch holds that the conversion of melanogen into melanin is due to the interaction within the cells of an enzyme—namely, an oxidase, such as causes vegetable and animal materials to change colour. The activity of a melanin oxidase is in accordance with the fact that the

"dopa" reaction does not occur in an atmosphere of nitrogen and is destroyed by heat. The milky juice of plants which yield lacquer is turned black by laccase; tryosin is made to change colour up to black by an enzyme, tyrosinase, found in many vegetable and animal materials. A familiar reaction is produced by an enzyme contained in red corpuscles on guaiacum in the presence of oxygen. The blood of some insects turns black on exposure to air from the formation of melanin.[14]

Another set of experiments has the same bearing. Quattini[15] injected pyrrole, also indole (benzopyrrole) and skatole or methylated indole, under the skin of rabbits, with the result that nine to eighteen days after the injection the skin of the animals became darkened by brownish lines and networks, spots and patches, along with an increased growth of pigmented hair. The pigment was very like melanin; it was not produced by the injection into an albino rabbit, nor in the white areas of animals having the skin partly white, partly coloured. In the albino rabbit the growth of hair was stimulated, but the hair remained unpigmented.

Tar painted repeatedly upon the skin of grey or brown mice for several weeks caused a pigmentation of the skin by the formation of melanin in the epidermis. This happens sometimes before the changes set in which lead up to cancer. In white mice, however, whilst precancerous and cancerous changes are produced a preliminary pigmentation of skin does not occur from the rubbing in of the tar. This appears to confirm the absence of melanogen in white mice.[16 17 37]

To demonstrate the presence of melanogen in melanotic cancer D'Agata injected pyrrole into non-pigmented tumours, rapidly developing secondary to a melanin-pigmented primary tumour in a dog. Pigment was afterwards found but was absent following control injections of salt solutions.[64]

Human melanotic cancer has not been transplanted into mice.

Clinical Observations on the Pathological Formation of Melanin.

The body louse, *Pediculus vestimenti*, when it punctures the skin with its haustellum to suck up blood, at the same time injects fluid from its salivary glands which produces a black spot of melanin pigment in the deepest layer of the epidermis. An emulsion of the insect's salivary glands has the same effect when injected; fluid from its stomach fails to do so. A man who presented the characteristics of phthiriasis had his back covered by black spots except over a white patch the size of the palm of the hand. This white patch, whether the result of congenital albinism or acquired vitiligo, had remained entirely unpigmented, owing presumably to the absence of melanogen.[18 19]

Women working in ill ventilated coal-tar factories, after inhaling fumes for a time, have exhibited a gradually increasing pigmentation of previously unpigmented skin.[20 21]

Arsenic taken by susceptible people to excess produces a pigmentation of the skin along with a keratosis affecting especially the palms of the hands and soles of the feet.[22 23]

In the earlier part of last century, when silver nitrate was administered freely by the mouth, or applied over long periods to the conjunctiva, argyria, an intra vitam staining by silver nitrate, occurred in some individuals. The face and other parts took on a patchy and diffused pigmentation of a slaty hue; the conjunctiva became bluish. When fresh skin, or sections of skin cut with a freezing microtome, are treated with a 1 pro mille solution of silver nitrate the silver nitrate combines with melanin pigment to darken it; afterwards there is a reduction to silver oxide. Catechol or pyrocatechin and its derivatives react with silver nitrate in the same way, and this is therefore another bit of evidence as to the composition of melanin.

Variations as to the presence or absence of melanogen in the skin may be held to account for individual differences in the pigmentation of the skin which follow the application of cantharides, the exposure of the skin to sunlight and artificial light rays—patches of leucoderma and vitiligo proving insusceptible. The effects of ultra-violet light rays also vary with the actual melanin already present—a brunette escapes sunburn, a blond suffers temporary irritation, or freckles are produced, temporary or persistent.

Increased pigmentation, general in causation, set up by changes in metabolism, appears to be connected especially with disturbances of endocrine functions.[24] Instances of this occur in connexion with the adrenals, exophthalmic goitre, liver diseases, and the female genital organs. The brown, waste, wear and tear pigment, found in the heart, liver, and under the mucous membrane of the colon consists of melanin, and the term "haemosiderin" is a misnomer.[25 26] Further, there is the increased pigmentation which supervenes in the course of various cachexias. A boy suffering from complications following scarlet fever had browning of the skin. Bits of his skin excised at intervals yielded the "dopa" reaction until the boy's general health began to improve. As the brown staining cleared off the "dopa" reaction weakened.

The peculiar form of increased pigmentation in young people undergoing sunlight and open-air treatment for tuberculosis appears to result from an improvement in metabolism. It is accompanied by increase of weight, muscular development, and a greater production of body heat so that clothing can be dispensed with. Gauvain[27] states that a failure to develop the pigmentation of the skin indicates a lack of resistance and a failure to overcome the disease. This, however, may be temporary, the increase in metabolism being checked until some latent source of sepsis is discovered and eradicated.

Adrenaline and Melanin Derived from a Common Mother Substance.

The note on chemical formulae and various preceding statements lead up to the explanation that the pigmentation which occurs in Addison's disease, also that in dogs after the removal of the adrenals, is due to the accumulation of a mother substance common to adrenaline and melanin. When the adrenals cease to take up this mother substance and convert it into adrenaline, the excess collects in the cells of the epidermis as melanogen to form melanin by oxidation. Pigmentation of a patch of vitiligo was obtained by injecting adrenaline, after which the patch was exposed to ultra-violet light rays.[28]

A solution of melanin was found to have the same effect on the blood vessels of a frog as one of adrenaline, only weaker; on the heart of a rabbit the solution of melanin exceeded in effect that of adrenaline.

Here I just mention the resemblances between the melanin produced in the ink-sac of Sepia and the Tyrian purple of the ancients, which some fishermen still use for marking their linen. Molluscs, Murex, and Purpura—*Murex brandaris* in particular—have a gland connected with the rectum composed of elongated columnar epithelium which secretes a fluid, originally colourless. The fluid under sunlight turns yellow, blue, reddish, violet, and purple. From the glands P. Friedländer[29] obtained dibromindigo in the form of crystals having a coppery hue. Roaf[30] found that fluid from the glands acted like adrenaline in raising blood pressure. In the course of preparation of the purple there was given off a sulphurous garlic-like odour, also a faecal odour such as is produced by substances allied to indigo; Pliny in describing the preparation of the dye spoke of this "virus grave in fuco."

Observations on the Loss of Pigment from the Hair.

Metchnikoff in his studies on Old Age assumed that pigment was actually withdrawn from the shafts of the hair, but subsequent observations have demonstrated that coloured, grey, and white hair are produced as such, according as the epithelial cells producing the hair also form melanin or not. Tales of the sudden blanching of hair may be treated with scepticism.

Observations regarding the growth of the summer and winter coat of the variable hare, stoat, etc., show that the change in autumn is due to a growth of non-pigmented hair whilst the brown hair of the summer coat falls out; early in the autumn, on separating the long brown hairs, short young unpigmented hairs are seen to be protruding from the skin. In the spring the variable hare gets rid of its winter coat, not only by licking, but by also "mouthing"

W. G. SPENCER: MELANOSIS (MELANIN: MELANOMA: MELANOTIC CANCER).

Fig. 1.—Belemnite with ink-sac and eight uncinate arms, in Oxford clay. (Museum specimen.)

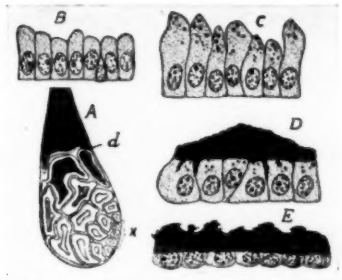

Fig. 3.—Diagrams from Dalgren and Kepner. A, Ink-sac; ×, loculated fundus; *d*, reservoir; B, C, D, E, stages of melanin formation.

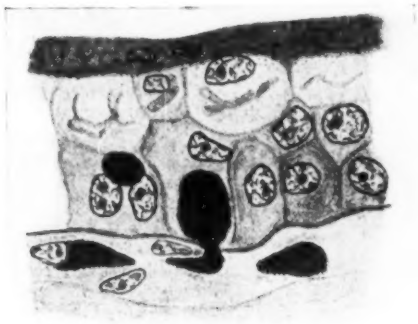

Fig. 4.—Tree-frog embryo: section from back. Melanophore in epidermis with process stretching down into dermis. (Kornfeld.[4])

Fig. 2.—Loculated ink-sac of sepia in section: epithelial cells exhibiting stages of melanin formation. (Mr. Burne.)

Fig. 8.—Normal blond skin—vertical section. Melanogen in basal cells of epidermis stained with "dopa": melanophores in dermis not stained; nuclei counterstained green. (Bloch.[18])

Fig. 5.—Tree-frog embryo later. Melanophores in dermis with processes extending up into epidermis. (Kornfeld.[4])

Fig. 6.—Tree-frog embryo: skin, subcutaneous tissue, muscle. All melanophores in subcutaneous tissue. (Kornfeld.[4])

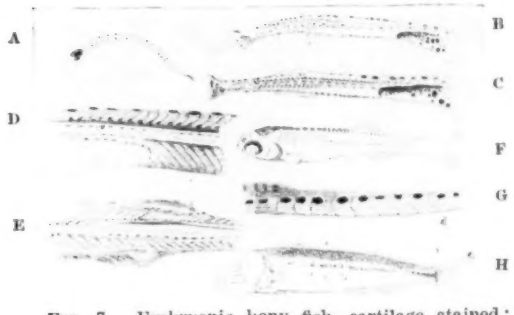

Fig. 7.—Embryonic bony fish—cartilage stained; segmental arrangement of melanophores. A, Atherina: melanophores lateral lines. B, Atherina: melanophores dorsal. lateral, and ventral lines; radiations fins and branchiae. C, Atherina—older. D Atherina: longitudinal section showing spinal cord, notochord, somites, and intersegmental lines. E, Atherina; fin radiations and intersegmental lines. F, *Alburnus lucidus:* metameric arrangement of melanophores. G, *Alburnus lucidus:* melanophore in each segment. H, Box boops—2 cm. in length; golden stripes when full-grown. (Bolk.[6])

FIG. 9.—Normal blond skin—horizontal section. Dendritic cells of Langerhans deeply stained by "dopa." (Bloch.[13])

FIG. 10.—Normal blond skin. Rugose mole stained by "dopa." (Bloch.[13])

FIG. 11.—Ano-genital region of grey mare with melanotic disease. (Nouch, in Library.)

FIG. 12.—Hairless skin under tail of white horse. Collections of melanophores around deep coiled ends of sweat glands. (Jaeger.[11])

FIG. 15.—Clustered melanotic growth: skin of thigh and melanotic whitlow. (J. Hutchinson, drawing in Museum.)

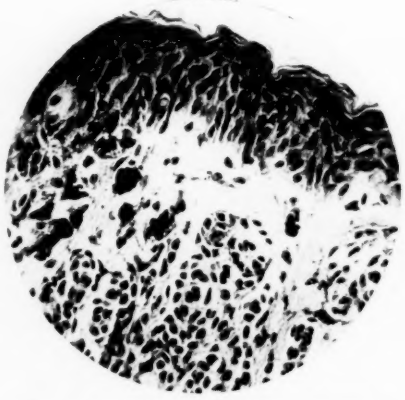

FIG. 13.—Vertical section through surface of mole which had become malignant. Pigmented cells penetrating downwards from epithelium. (W. G. S.)

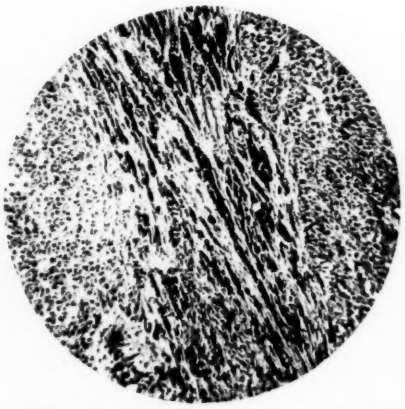

FIG. 14.—Deeper portion of same. Pigmented cells which have become oval and spindle shaped, cut some longitudinally, some transversely. (W. G. S.)

FIG. 16.—Melanotic cancer spreading from pia mater into brain. (W. G. S.)

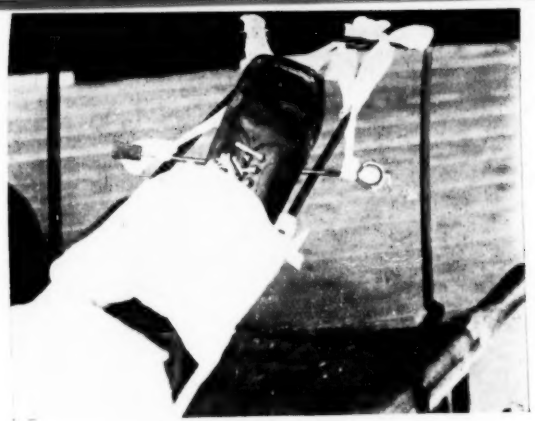

FIG. 1.—First-aid treatment of any fracture of the lower limb, showing the "pin" passing through the boot and a "stretcher suspension bar" suspending the Thomas splint and limb.

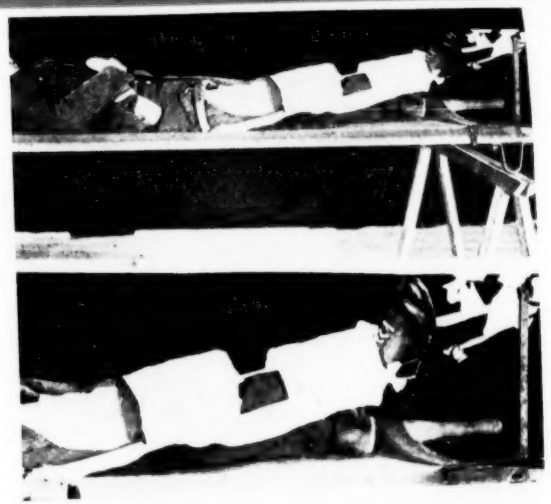

FIG. 2.—Showing the method of first-aid splinting of any fracture of the lower limb—in this case one of the middle third of the femur—with a window cut in the clothing.

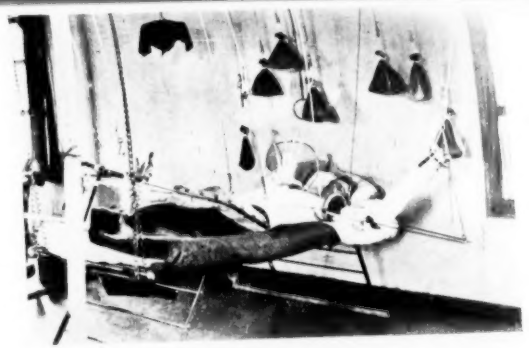

FIG. 3.—Multiple closed fractures of all four limbs, splinted and suspended for permanent treatment. This patient was blown by a shell through two walls of a house, and sustained seventeen complete fractures.

FIG. 4.—Two screws in the tibia whose axes are oblique by election.

FIG. 5.—Antero-posterior view, showing displacements of a fracture of the radius.

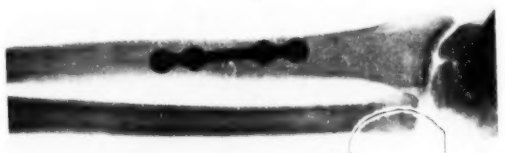

FIG. 6.—Antero-posterior view, showing replacement of fragments and plate, after operation.

FIG. 7.—Lateral view, after operation.

FIG. 8.—Antero-posterior view. The patient was discharged from hospital to full duty.

FIG. 9.—Lateral view of the same case on discharge from hospital.

Fig. 17.—Lateral view of the same case after operation of wiring: a portion of the wire loop can just be seen above the bars of the Thomas splint.

Fig. 18.—Antero-posterior view of the displacement in a closed fracture of the femur involving the knee-joint.

Fig. 19.—Antero-posterior view of the replacement and the fracture in good line after wiring.

Fig. 14.—Antero-posterior view of a closed fracture of the lower third of femur with lateral displacement of fragments, which were entangled in muscle to such an extent as to render reduction by external manipulation impossible.

Fig. 15.—Lateral view of the same case, showing marked backward displacement of lower fragment.

Fig. 16.—Antero-posterior view after operation of wiring.

Fig. 10.—Open comminuted fracture from the result of a motor cycle accident abroad on March 13th, 1921. Admitted on December 10th, 1921, with wounds healed and malunion, as shown in the lateral view.

Fig. 11.—The antero-posterior view of the same case after replacement of the fragments and plating on January 31st, 1922.

Fig. 12.—The antero-posterior view on discharge from hospital to his home, as a walking case, without any shortening, on March 27th, 1923.

hair, some of which hairs are found in its faeces. Under the long unpigmented hair of the winter coat, short pigmented hairs are to be found.[1]

Loss of the Pigmented Hair in Grey Horses followed by Melanosis.

Grey horses after the age of ten years tend to become white owing to the loss of pigmented hair, including the hair of the mane and tail. With increasing age these animals develop some form of melanotic cancer with such increasing frequency as to give rise to the statement that if a white horse lives long enough some degree of melanotic new growth will be found on a complete examination after death.[31] Horses which keep their hair dark very rarely suffer. The skin covered by the white hair is likewise unpigmented, but the pitch-black pigmented skin, free from hair, of the ano-genital region, mammae, scrotum, and folds of the prepuce, also the margin of the lower lip, remains unaltered. This deeply pigmented hairless skin is a site of predilection for the starting of melanotic disease (Fig. 11). It is first noticeable as small black nodules which run together into tumours and then come to be embedded in a general thickening which later has the characteristic appearance of rugose elephantiasis. Preceding this naked-eye appearance there have been found microscopic changes; when vertical sections are made through the skin under the tail of an aged white horse isolated pigmented spots may be seen, in particular near the deep coiled ends of the sweat glands (Fig. 12). On the other hand, examination of the same skin taken from an old horse which has retained pigmented hair fails to discover such collection of pigmented cells. The melanotic disease does not extend superficially beyond the black hairless areas, but removal is only practicable in the case of melanotic elephantiasis of the folds of the prepuce. The inguinal glands enlarge early, but remain circumscribed and do not infiltrate. The two commonest external manifestations of secondary disease are in the parotid region, and between the scapula and spine, deep in the rhomboid muscles. Similar instances occur in human beings; a case of scapular metastasis was described by Cairns.[32] From the ano-genital and inguinal regions the disease spreads to pelvic and lumbar glands, to the abdominal and thoracic viscera. Black cords and chains of nodules are found in the retroperitoneal tissue, masses in the spleen, etc., at the root of the lungs, and around the base of the heart. There is a marked absence of general wasting, the animal working until it dies suddenly. The enormous growths cause mechanical obstruction by displacement of tissues without general infiltration. Whilst in human beings the growths commonly remain solid, in horses they are often cystic. Haycock wrote his note with the black fluid contained in one of the cysts, just as Cuvier drew a sepia with the animal's ink. A cystic tumour of the spleen or lung may rupture and cause immediate death of the horse.

Congenital Melanomas becoming Melanotic Cancer.

Pigmented naevi exhibit melanin granules in the basal layer of the epidermis, and to a variable but much smaller extent in the rete spinosum. Moles which are rugose on the surface have fewer rows of cells in the rete spinosum, and an increased thickness of the corneous layers.

The original structure of the pigmented naevus consists of a regular arrangement of cells, the epidermis being clearly distinguished from the dermis. During adult life there is a slow degeneration, variable in degree, to be recognized by a full examination of a number of specimens.[33] The epidermis and dermis become less sharply defined; there are branched pigmented cells in the dermis, some are epithelial cells which have dipped down, some connective tissue cells which have taken up pigment freed by the breaking down of epithelial cells (Fig. 13). Free granules of pigment are found in lymphatic spaces and cells may have a dusky stain. These changes are to be noted before any sign of cancer, but also in the areas surrounding the commencement of cancer.[34]

The malignant growth begins in the lowest layer of the epidermis, and resembles either one of the varieties of rodent ulcer or squamous-celled carcinoma. Just as sections of chimney-sweeps' cancer show granules of soot in the cells growing downwards,[35] so also in melanotic cancer the growing margin of cells exhibits melanin granules. As the epithelial cells grow down into the dermis they tend to assume an oval or spindle shape (Fig. 14), later on an alveolar arrangement; they break into lymphatics, invade the wall of blood vessels, and set up haemorrhage.

The masses of melanotic cancer in lymphatic glands and internal organs are composed of oval and spindle cells. Whilst recent observations indicate epidermal cells as those which commence the malignant change, the appearances of the tumours have led them to be termed sarcomata. Paget, in his lectures, generally used the term "melanotic cancer," and I have followed him in that respect. Discussion has proceeded much on the same lines as earlier debates concerning the origin of the elements composing a scirrhous cancer of the breast, also as regards the cancers produced by rubbing tar into the ears of animals.[36] [37]

Melanomas are very common among darker races, indeed more so than among white races, yet this does not render them prone to melanotic disease. No great stress can, perhaps, be laid on this point, because such races are generally reported to be less susceptible to cancer in general. Seligman[1] noted among natives of New Guinea that pigmented moles were common on all parts of the body, both in men and women. Yet no case was seen or heard of in which a pigmented mole had tended to spread or give rise to tumour formation. Among 8,000 hospital surgical in-patients belonging to dark races in Constantinople[38] there were 390 cases of carcinoma, 125 of sarcoma, and 3 of melanotic cancer; two of the latter had grown from the relatively unpigmented sole of the foot, and one involved the gall bladder after the patient had suffered from what had been called piles. Among 12,000 surgical out-patients there were no cases; among 2,000 eye cases there were two—one originating in the conjunctiva, the other in the ciliary body. The occurrence seems likewise rare among negroes in the United States; the only case I have noted, one described by Gilchrist,[39] began on the relatively unpigmented sole of a negro, as in the two Constantinople cases.

An exceptional case was seen by me in conjunction with Dr. Redmond Roche. A boy aged 5 was the son of brunette parents both of whom presented numerous superficial pigmented moles; on the dorsum of one of the boy's toes was a superficial ulcer with a black surface which had been treated as a chilblain. On two other toes were quiescent pigmented moles. In the corresponding groin was a gland enlarged to the size of a hazel nut. Examined after excision the ulcerated mole exhibited pigmented cells and haemorrhages in the base of the ulcer; the corresponding enlarged gland showed foci of pigmented cells and haemorrhages. The other two proved to be quiescent epithelial melanomas. I cannot give a subsequent report on the case, but at such an age malignant disease may be considered out of the question.

Pigmented spots acquired after puberty or late in life may also become malignant. Hutchinson described several varieties. By 1886 he had seen half a dozen cases of melanotic whitlow; many more instances have been described since that date, all remarkably alike, and all pursuing a malignant course (Fig. 15). They are instances of melanotic squamous-celled carcinoma. The specimen described by Bowlby[40] occurred on the great toe—half is in the College Museum, half in that of St. Bartholomew's Hospital. In Csaki's case the toe-nail from childhood had separated on many occasions before melanosis set in.[41]

Hutchinson also described the senile freckles, lentigo senilis, which occasionally become malignant.[2] [42] The clinical course and structure of the growth is then as a rule that of rodent ulcer followed ultimately by a metastasis.

A slight puncture of the skin may leave a pigmented spot which subsequently becomes the seat of melanotic cancer. In Eve's case a woman at the age of 27 ran a splinter into the hypothenar eminence, and a black spot persisted there for twelve years, until after being again accidentally pricked. Melanotic cancer then started, of which she died eleven months later.[43] Two of the Museum specimens are from a man aged 55 in whom melanotic cancer supervened from a puncture by a horn under the jaw three months before. The man died of the disease fifteen months after the injury.

Metastasis of Melanotic Cancer.

Once the malignant change has started metastasis follows, whether it becomes apparent soon or late; there are extra-

ordinary instances of delay in its appearance. Coley reported 91 cases treated by excision, also by his toxins, radium, and x rays. The primary treatment of a pigmented mole which had begun to spread failed, whichever of the above means was used.[44] In Küttner's Klinik from 1890 onwards there were 39 cases of melanotic cancer. Of 26 submitted to operation 4 survived the first operation for five years, soon after which 3 died of generalized melanotic cancer.

A few individuals appear to present an extraordinary resistance to the extension of the cancer.[45]

Chauvin operated four times upon a woman in the course of twenty-two years.[46] At the age of 28 a brown mole which had ulcerated was removed from the right naso-labial furrow; it exhibited under the microscope the structure of melanotic cancer. Four years later a similar nodule was removed from the right malar region, and two years subsequently a further recurrence at the same spot. For the fourth time, the patient being then 48, two nodules of melanotic cancer, placed on the line of the lymphatics in the course of the facial artery, were cut out. There was then no sign of lymphatic gland enlargement or of metastasis.

Eve[47] described the case of a woman who twenty years before had a melanoma cut out from the dorsum of the hand. There was a recurrence *in situ* ten years later, and a second recurrence at the end of twenty years, when there were in addition metastatic growths in the axilla and on the temple.

Mr. Jonathan Hutchinson, junr., verbally informed me that he saw a woman who for ten years had discharged a melanotic fluid from the stump after the removal of the eyeball by Tay for melanotic cancer.

A widely diffused pigmentation of the skin has occurred in the course of generalized melanotic cancer. Cases have been described by Fergusson, Legg, Matsunga,[47] and Tietze. Such increased production of melanogen and melanin has been previously emphasized.

Melanotic Cancer of the Eyeball.

Both in men and animals there occur abnormalities of pigmentation in all grades down to complete albinism. The parti-coloured iris is a slight abnormality; the so-called "wall eye" is common in the horse, and includes a greater abnormality affecting the uveal layer in the choroid and ciliary bodies. But in the most complete albinism the retinal pigment epithelium is constantly normal.[1]

Mr. Foster Moore, in the course of routine examinations of the ocular fundus, has noted patches of pigment, which, however, had given rise to no defects of vision. The patches are situated near the optic disc not more than two diameters of the disc away, having an area of a quarter to four times that of the disc. They have a homogeneous colour, likened to that of blue ointment, an oval or circular contour, and a feathered edge with the retinal vessels, normal in character, crossing in front. One patch examined *post mortem* showed a structure corresponding with a mole on the skin, and so these patches appear to be congenital in origin. The patches remained quiescent under observation, and no relationship with melanotic cancer has been established.[48]

In spite of the frequency of "wall eye" in horses, a melanotic cancer of the eyeball is rare even in the grey horse which turns white.

Melanotic cancer arises in the eyeball as a rule after middle life. Whilst it generally arises from the pigmented layers within the eyeball, it may start external to the eyeball in the conjunctiva or eyelid, when it may be in a congenital or acquired spot of pigment.[52] It has often followed upon an injury, but the onset may be delayed.

In Lawson's case the eyeball had been injured and shrunken for twelve years.[49] In Keown's case the patient had been for long exposed to an excess of electric light.[50] In Pfingst's case the disease occurred in two brothers;[51] in Silcock's in a mother and daughter. In Robinson's case a pigmented spot appeared on the outer surface of the upper eyelid and gradually spread over the forehead and cheek; later there was extension to the mucous membrane within the cheek and to the opposite eyelid.[53]

Melanotic cancer as a rule has advanced so far before the eyeball was removed that patients have died of metastasis even although there has been no recurrence *in situ*. The usual course is for a secondary mass in the liver, etc., to be attended by melanuria and to cause the patient's death within three years.[54] Death may, however, be delayed; there may even be extraordinary delay—namely, for 10, 12, 16, 17, and even 24 years in Olbert's case.[55] Except after melanotic growths of the eyeball, melanotic cancer of the liver with melanuria is rather the exception, otherwise one might almost believe such prolonged intervals to indicate an origin *de novo*.[56]

Melanoma and Melanotic Cancer of the Hard Palate.

Congenital patches may be noted on the hard palate, also on the inner aspects of the cheek and tongue in dark races—for example, Dravidian races in India. They have also been stated to appear for the first time in middle life and afterwards to spread. When cut out early the structure is found to be that of quiescent melanomas. More than twenty-five cases have been recorded of melanotic cancer of the hard palate. Treatment by excision, x rays, radium, diathermy have all alike failed to arrest the spread of the disease.[57]

Melanotic Cancer of the Abdomen.

Melanotic cancer in the abdominal cavity is usually secondary. As to a primary origin in the abdomen recorded cases have not been completely investigated—for example, as to the possibility of a supposed benign mole in the skin having undergone a malignant change discoverable only by microscopic examination. With this reservation melanotic cancer has been described as arising in the suprarenal capsule on one or both sides, in the ovary, urinary bladder, and gall bladder. The general explanation would be that the origin has been in one of the congenital patches of pigment which have been classified as perineural, perivascular, pericoelomic.

Melanoma and Melanotic Cancer in the Ano-genital Region.

This is an area which exhibits some pigmentation even in blond races. Pigmented moles are common on the external genitals of dark women, and in Indian women pigmented patches have been noted on the wall of the vagina and cervix uteri. Eardley Holland collected fifty-two cases of melanotic cancer of the vulva, of which number only one woman was free from signs of recurrence after three years.[58] A melanotic cancer of the vulva may be secondary; in Doran's case it followed upon an adrenal tumour, and he included references to two similar cases. A melanotic cancer of the penis is of rare occurrence: Shattock showed how readily the unpigmented glans of the negro becomes pigmented when uncovered. Primary melanotic cancer of the anus has been in its earlier stages confused with piles. In the negro the pigmentation of the skin is sometimes continued irregularly within the anus, and such an explanation may be given of the starting of a melanotic cancer in the rectum.[59] In Heaton's Museum specimen a man aged 48 had had haemorrhoids for twenty-five years when melanotic cancer set in, and after his death seven months later there were found invasion of lympathic glands and a nodule of melanotic cancer on the surface of the liver.

Perineural Melanotic Cancer in the Pia Mater of the Brain and Spinal Cord.

In a few cases it has been possible to define the situation in which the growth started. In Hirschberg's case it commenced at the level of the eleventh dorsal vertebra;[60] in Ogle's case in the pineal body, when the pigment may be related to the so-called median eye of the lizard Hatteria or Sphenodon.[60] MacLachlan described an extensive pigmentation associated in children with multiple pigmented naevi on the skin.[61] There were small pigmented nodules the size of millet seeds scattered along the course of the blood vessels of the pia mater and of the ependyma of the ventricles.

Generally at *post-mortem* examinations melanotic cancer has been found widely disseminated in the pia mater with multiple tumours, when it has not been possible to identify the actual starting point (Fig. 16). There has been a relative absence of signs, largely due, as in Babinski's case, to the growth not infiltrating but displacing the original tissues.[62] I exhibit specimens in which it was impossible to discover the seat of origin of the disease.

A woman, aged 36, had suffered vaguely in her head for four months. On admission to the Westminster Hospital a diagnosis of increased intracranial tension from multiple new growths was made. The patient was not relieved by decompression. The pia mater over the under surface of the medulla, pons, cerebellum,

and olfactory lobes presented a dark brown greenish staining. The cortex of the cerebrum, pons, and cerebellum under the pia mater exhibited numerous black nodules and spots. There were melanotic tumours in the base of the left lung, in the liver, in the retro-peritoneal tissue, and adherent to the outside of both suprarenal capsules, the substance of these organs being unaltered.

Melanotic Cancer in the Olfactory Mucous Membrane.

I have already stated that melanin pigment is of regular occurrence in the olfactory epithelium and in that of the labyrinth. Mr. de Santi has recently removed a melanotic cancer growing high up on the nasal septum, and the patient so far has no recurrence. The case is an extremely rare one. Mr. Arthur Cheatle has informed me that the occurrence of a melanotic growth in the labyrinth is not known to him.

CONCLUSION.

Experience incident to the removal of a large number of melanomas is similar to that in connexion with other varieties of new growths. Free and early excision is not followed by recurrence *in situ* except in malignant cases where the disease has already spread widely. Simultaneously with the change from melanoma to melanotic cancer there is a detachment and degeneration of cells producing metastasis which exhibits itself later on.

The general bearing of recent observations suggests the hope that further chemical research may arrive at a means of controlling the disease by therapeutic measures.

REFERENCES.

[Many references are included in those quoted below; references up to 1911 especially under (1).]

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DIFFICULT MIDWIFERY IN GENERAL PRACTICE.*

BY

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IN reading a paper and opening a discussion on such a comprehensive subject as difficult labour, I intend to limit myself to certain conditions and varieties of difficult labour which occur most frequently. In some of these the treatment has altered during recent years, and what was the accepted practice twenty years ago is now changed or considerably modified.

I would begin by emphasizing the fact that the importance of the obstetric branch of the art of medicine has of late been recognized in all the teaching schools. Less than twenty years ago the hospital student gleaned a few rudimentary facts from some small manual and proceeded to attend cases on the district with but a sketchy knowledge of the essential principles; the student of the present day attends the lying-in ward of his hospital day and night for a month before being allowed to attend cases on the district; and instead of an optional two months he is obliged to act as clinical clerk in the obstetric department for four months. Thus, by adequate instruction on normal cases and a considerable experience of abnormal cases, he comes to realize two very important things: first, the value of patience and the danger of interference in straightforward cases; and secondly, the importance of correct diagnosis in a difficult case so that the appropriate treatment may be carried out.

What the newly qualified doctor of the present day finds difficult is how to apply his hospital methods to general practice. For whereas in the hospital maternity ward time is no object, this is very far from being the case in private practice, and the doctor is found to be confronted at times with the problem of what is the best thing to do "in the circumstances." Sometimes forceps are applied before the suitable time has really arrived. In others, version has been performed. Sometimes all goes well, but at others the result is disastrous. The only real remedy lies in providing sufficient maternity beds in hospital in all towns for cases of difficult labour. Until such a time arrives I think it is fair to say that most doctors are to be congratulated on the skill and ingenuity displayed in conducting a busy midwifery practice. No doctor with surgical inclinations would dream of starting to remove an appendix in an ordinary bedroom, but there is no doubt that this is safer than many operations of difficult labour. In order to justify this assertion I would state that the mortality due to, and resulting from, childbirth is still very high for a "purely physiological" process, as it is termed.

The death rate per 1,000 births in 1920 was 4.1 (of which about 2.25 were directly due to abnormal labour, and 1.87 to puerperal sepsis of which the cause was often difficult labour).

Next, I will digress from the subject of my paper in order to speak about a theme of the greatest importance—namely, the prevention of difficult labour; and herein lies the most important advance in the practice of obstetrics.

The Prevention of Difficult Labour.

Ante-natal clinics have been formed and are still being formed all over the country, where the care of expectant mothers is carried on with great zeal. In the ante-natal clinic of to-day the pregnant woman is examined from time to time so as to exclude any possibility of difficult labour arising unforeseen. In noting the important points some such scheme as the following is used:

Scheme for Notes.

Age.
Date of last menstrual period.
Expected date of confinement.
Previous pregnancies or labours, with their character.
External Measurement: Interspinous. Intercristal.

* A paper read before the Dover and Folkestone Branch of the British Medical Association.

Abdominal Examination:
Height of fundus uteri; waist girth.
Lie and presentation of the foetus.
Foetal heart.
Size and situation of the foetal head, and whether it is engaged or can be made to engage in the brim of the pelvis.

Vaginal Examination:
Whether there is any abnormality of the soft parts.
Whether the sacral promontory can be felt; if so, the diagonal conjugate must be measured.
Whether the foetal head is engaged.
Whether there is any tumour in the pelvis.

Examination of the Urine:
This examination should be made during the seventh month and repeated about the thirty-sixth week, or more often if necessary.

At or soon after the thirty-sixth week it will generally be possible in a normal woman with a normal pelvis to say that labour will be normal.

This examination, carried out as a routine in all cases, is absolutely indispensable in first pregnancies, where special precautions have to be taken to deal with the following abnormalities: contracted pelvis; large foetus; breech presentations; other abnormal presentations.

This brings me to the first cause of difficult labour—namely, the contracted pelvis.

Contracted Pelvis.

Extreme degrees of contracted pelvis calling for Caesarean section are rare. Slight degrees of pelvic contraction are common and perhaps one of the commonest causes of difficult labour. For if the contraction be slight, examination during the last week or two of pregnancy may reveal nothing obviously wrong; when labour starts, however, the head fails to descend through the brim of the pelvis and early rupture of the membranes may occur. In such cases it is most important to make preparation for a long labour, and to make a firm resolution not to apply forceps until it is certain that the woman is unable to deliver herself unaided. In the early stages it is important to empty the bowels by castor oil and an enema, and to keep the bladder emptied, and maintain the patient's strength by light nourishment at frequent intervals. The keynote of the treatment is to allow time for the head to mould. The patient generally requires rest and sleep during such a labour, and this is best ensured by giving an injection of half a cubic centimetre of omnopon with scopolamine, repeated in an hour if necessary. There is no drug or combination of drugs so valuable, in my opinion, owing to its certainty of action. Forceps should be withheld until the following indications are present:

1. Foetal distress.
2. The head is sufficiently moulded and low down in the pelvis to allow a reasonable chance of delivery.
3. Maternal distress.
4. Commencing oedema of the vulva or vaginal orifice.

Cases in which these rules are disregarded are far from uncommon in the crowded districts of London; the patient, generally a primigravida, is sent up to hospital by her doctor because he has failed to deliver her with forceps. On examination she is found to be suffering from shock, but the os uteri is not completely dilated. An injection of omnopon and scopolamine is given and after a few hours' rest or sleep spontaneous delivery not uncommonly occurs.

Large Size of the Foetus and Foetal Head.

This is as common or commoner than contracted pelvis as a cause of difficult labour, and results in many cases from post-maturity. I have recently been much impressed with the frequency and importance of prolonged pregnancy. The normal period of gestation is 280 days, or forty weeks from the first day of the last menstrual period, but it is not infrequently prolonged a week or two. The foetus thus becomes unduly large and its head abnormally hard, so that when labour does come on it is difficult and prolonged, there is tearing of the maternal soft parts, and risk of injury to, or death of, the infant. Such difficulty can be prevented by terminating labour at the appointed date. This can be brought about by a simple scheme of treatment, provided that the details are carried out with care and precision. The scheme, which may be called the "Intensive Method of Induction," is as follows:

On the expected date of confinement, first thing in the morning, say 7 o'clock, one ounce of castor oil is given; the result is best if it is given emulsified in a cup of very hot milk. After this a light breakfast is allowed. One hour later a hot bath is given for about fifteen minutes, the patient being immersed up to her waist. After this a tight binder is applied. One hour later a copious enema of soap and water is given. One hour later 10 grains of quinine sulphate are given with a hot drink. If labour does not start within two hours, 10 grains more of quinine sulphate are given with a hot drink, and this may be repeated again two hours later.

During the past six months this method has given uniformly good results in the obstetric ward of the London Hospital, and in other private cases directly and indirectly under my care, not only for women at term, but also as a means of inducing premature labour. In the event of the treatment being unsuccessful in its object it may be repeated in forty-eight hours and supplemented by two or three small injections of pituitrin. If this treatment is unsuccessful a second time, labour may be brought on by the introduction of bougies. In addition to the cases where pregnancy is prolonged, there are those in which it is advisable to bring on labour a week or two before full term because the foetal head has not engaged and seems to be getting large. There are also the cases of pelvic contraction in which premature induction of labour has to be carried out about four to five weeks before term.

Breech Presentation.

Next, I would like to mention the difficulties resulting from breech labour. These include primary and secondary uterine inertia, prolonged labour, and extension of arms, legs, and head. There is generally no real risk to the mother except that of a torn perineum, but there is a definite risk to the foetus especially in first labours, in which the mortality is certainly over 10 per cent. It is, therefore, important to prevent breech labour in primigravidae; this can be done by performing external version before labour starts, and converting the breech into a vertex. The most suitable time at which this can be done is the thirty-fifth week.

Ante-partum Haemorrhage.

Of recent years the treatment of ante-partum haemorrhage has followed much more conservative lines than formerly. First, it is important to find out whether the bleeding is accidental or whether it results from placenta praevia. If the placenta cannot be felt by the finger passed through the cervical canal into the uterus the case should be treated as one of accidental haemorrhage and an expectant policy adopted for at least twenty-four hours. The patient is put to bed—in a hospital or nursing home if possible—and a hypodermic injection of morphine is given. Plenty of fluid may be taken by the mouth and in severe cases rectal saline may be given. The essentials are rest and warmth, so that the patient may recover from shock and the tone of the uterus may be restored. In many cases labour starts within twenty-four hours and spontaneous delivery takes place. If labour does not come on and fresh bleeding occurs, the best treatment is to rupture the membranes or to give an injection of pituitary extract. Either method will generally be followed by the onset of labour within a few hours. The advantage of rupture of the membranes is that labour is pretty certain to come on without delay; the disadvantage of pituitary extract is that its effect may wear off after a few hours and the uterus may again become atonic. If rupture of the membranes is followed by pains which are weak and infrequent there is no objection to giving an injection of pituitrin as well.

The same method of treatment may be followed in some cases of placenta praevia, but more often the bleeding is severe and recurrent, if not continuous, so that steps must be taken to stop the bleeding by inserting a Champetier de Ribes's bag or by performing version and bringing down a leg. But here again there are many cases which do very well if the membranes are ruptured and a tight binder applied. The treatment of placenta praevia by

sarean section is but rarely indicated, and should be reved for special cases, as follows: (1) When the patient is primigravida with a rigid undilated os and central centa praevia, and the foetus is known to be alive. (2) When the patient is a multipara who has lost a lot of od and can ill afford to lose any more. If I might phasize one point in the treatment of ante-partum emorrhage it is that the condition is one in which the vantages of treatment in a hospital or nursing home are y great.

Version.

I have already mentioned the value of external version ring the later weeks of pregnancy to convert a breech sentation into a vertex. In such cases it may be easy, an anaesthetic is often required. Version is also the rect treatment for a transverse lie, and in certain cases placenta praevia. Version should never be performed effect delivery when the presentation is a vertex and rceps have failed to effect delivery, for in such a case ere is great danger of rupturing the uterus. This nger is very real in a transverse lie if version is tempted late in labour. Whenever the uterus is coming irritable, and the pains are strong and frequent d cannot be completely abolished by anaesthesia, it is safe to attempt version. In such a case the foetus is early always dead, and its life need not be considered s in any way comparable with the mother's safety. elivery should therefore be effected after perforation of e foetal head in a vertex presentation, or after decapitaon for a transverse lie.

In placenta praevia and in accidental haemorrhage the terine wall may be weak in places and easily ruptured any force is used in performing version. Version should ot be persevered with if reasonable attempts are unccessful, as the failure may be due to insufficient liquor mnii.

Post-partum Haemorrhage.

As in ante-partum haemorrhage, the cause of postrtum haemorrhage is generally (1) uterine exhaustion or ck of tone; (2) some placenta or membranes left behind the uterus. In my opinion a most important predisosing cause of these two conditions is chloroform when ven in fair quantity for a prolonged period, especially pushed to a sufficient extent to allow the application of nstruments. There is nothing which abolishes uterine ntractions so quickly and effectually as chloroform, or, a lesser extent, ether; and if the anaesthetic is given r any length of time there is likely to be difficulty in the ird stage owing to deficient uterine contractions and ost-partum haemorrhage will occur.

Post-partum haemorrhage is also likely to follow the verdistension of the uterus by twin pregnancy or ydramnios. In such cases, therefore, it is very important keep very careful watch over the uterus for at least an ur after the delivery of the infant, and to have prerations in hand for a hot vaginal and intrauterine ouche. If haemorrhage occurs after the expulsion of the centa a hypodermic injection of pituitary extract should given at once, and should be followed by a hypodermic jection of ergot.

Caesarean Section.

The comparative ease and safety with which Caesarean ction can be performed has led to a considerable increase the number of the operations. The scope of the operaon has been widened to include not only the extreme ses of contracted pelvis, but also cases of pelvic conraction of a minor degree, of malpresentations, of clampsia, of placenta praevia, and of accidental haemorage. The increased frequency with which the operation s been performed during the last few years has been companied by, first, an increased maternal mortality, d secondly, a considerable number of unfavourable postperative sequelae of which the most serious is rupture the uterine scar in a subsequent pregnancy. The result that the pendulum has begun to swing in the opposite rection, and the number of cases of Caesarean section, the London hospitals at any rate, has dropped conderably. The indications for Caesarean section should certainly be as definite as for any other major operation. Before Caesarean section is undertaken the following points should be ascertained: (1) that the foetus is alive; (2) that the foetus has no reasonable chance of delivery *per vias naturales;* (3) that the labour is not far advanced; (4) that there is no undue risk to the mother. The great risk in the operation is sepsis from the uterus, resulting in death of the mother from peritonitis or septicaemia, or breaking down of the abdominal or uterine wound. If any sepsis be present the uterine wound will not heal well so as to leave a good scar. Weakness of the scar may also result from inefficient suture of the uterine wound. There is no operation in which it is more important to have favourable conditions for the carrying out of a perfect aseptic technique. The risk of a weak scar has of recent years been overcome by making the incision into the uterus through the lower uterine segment after pushing down the bladder. The objection to this is that the operation is more difficult, and if the child is large it may be difficult to extract. The incision has much to recommend it, and I consider it a marked advance on the old incision. Caesarean section in cases of eclampsia has a high mortality, among hospital patients at any rate, and is performed less frequently than formerly. Caesarean section in cases of central placenta praevia or severe accidental haemorrhage is, in my opinion, a good method of treatment in picked cases.

Unreduced Occipito-posterior Position.

The difficulties likely to arise in connexion with an occipito-posterior position result from uterine inertia, prolonged labour, and the application of forceps. Following these there may be a torn perineum, torn cervix, or injury to the bladder, and permanent weakness of the pelvic floor resulting from difficult forceps delivery. There is also a possibility of rupture of the uterus during forceps or manipulations. The correct treatment consists in making sure of the diagnosis when the condition is suspected, and promoting flexion of the foetal head during the first stage, by posture. If the occiput does not rotate after a reasonable time in the second stage an anaesthetic should be given and the head, with the body of the foetus, should be rotated. If reduction cannot be performed and the head is well down, tentative and judicious trial of axis traction forceps may be made. If the head does not descend with gentle traction, perforation of the foetal head should be performed.

After the paper there was a discussion, and questions were asked by many members present. In reply Mr. Luker pointed out that he did not think that any harm resulted from giving drops of chloroform during the latter part of the second stage, but he wished to emphasize the danger, in his opinion, of large quantities for any length of time.

ACUTE LUMBAGO TREATED BY THE INJECTION OF QUININE AND UREA.

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Of common minor ailments there is none which may be more completely paralysing than acute lumbago. In an instant an individual in the full vigour of health may find himself unable to make the slightest movement of the trunk without the most exquisite pain, and he may remain confined to bed for weeks as an absolute cripple. Even in the slightest cases, though the acute symptoms may pass off in a few days, it will be ten days at least before he can stoop with freedom and comfort. In severe cases the slightest movement, or even a sudden noise, may induce a spasm of pain, with a violent contraction of the lumbar muscles, a reflex attempt at protective fixation. The contraction may last for several seconds, and only slowly and cautiously will the patient allow the muscles to relax.

An attack is often brought on by a chill following exertion, such as may occur from sitting in clothes damp from perspiration. An attempted movement produces a spasm

of pain, and after that free movement is impossible. The pathological basis is very obscure and probably involves a number of different factors. The circulation in the muscles, diminished by cold, is unable to remove the waste products resulting from recent activity. Probably the muscle responds to stimuli by an irregular spasm, and a few of its fibres are torn from their origin. This conception would at least explain the fact that it is almost always at a point of attachment that tenderness is most marked.

Though the sudden onset is strongly suggestive of a traumatic origin there is usually a slight but definite constitutional disturbance, and it seems probable that the trauma would be ineffective in the absence of some error in general metabolism, perhaps due to a low grade of infection. But the local symptoms are so severe as entirely to absorb the patient's attention. A close examination will indeed show that the source of these symptoms is even more narrowly localized than the patient imagines, and that the pain spreads from a very small focus characterized by exquisite tenderness to deep pressure. This focus may be situated anywhere in the lumbar muscles, and in addition to its excessive sensitiveness may be marked by a slight local swelling, with an oedema which pits on pressure.

The precise localization of the focus of pain naturally suggests some local form of treatment, and a large number of methods have been recommended. Radiant heat, dry cupping, heavy massage, the insertion of long needles, and the actual cautery, all have their advocates, but the more lenient methods are tedious, whilst the more drastic are somewhat oriental. It occurred to me that the injection of a local anaesthetic would be a rational method to employ, and could at least do no harm. I was scarcely prepared, however, for the instantaneous cures which I have observed, and still less for their permanence.

The anaesthetic I chose was quinine and urea hydrochloride in 1 per cent. solution, and I selected it because of the length of time, up to several days, for which the anaesthesia may last. I thought at first that the action might be purely mechanical and I tried normal saline solution, but the effect proved to be only transitory. 5 c.cm. of the solution is injected through a long fine needle into the centre of the tender spot; within ten minutes the acute pain has entirely disappeared and the patient can move freely; a sense of stiffness remains, and a curious feature is that the patient may complain of a general malaise. It has seemed to me probable that some constitutional disturbance is a regular feature of the condition, but that it is masked by the severity of the local pain.

The following cases illustrate clearly the method employed and the results.

A lady, aged 45, was suddenly seized with severe pain in the right loin. The pain came in spasms so severe that whilst they lasted the right leg appeared to be paralysed and the possibility of a lesion of the lumbar roots was even considered. She lay in bed unable to move, the slightest attempt at movement provoking an attack of pain. Massage, radiant heat, and moist heat only gave partial and temporary relief. Below the iliac crest and just external to the right sacro-iliac joint was an area about the size of a florin, slightly boggy to pressure, and exquisitely tender. Into this area a hypodermic needle was passed till it reached the bone, and 5 c.cm. of a 1 per cent. solution of quinine and urea hydrochloride was injected. Ten minutes later the patient found that she could move without producing a spasm, and in two hours she could get up and walk. There were no further spasms, and beyond a feeling of stiffness which lasted for ten days she declared herself cured.

A lady, aged 52, passing through London was seized with violent pain in the lower right lumbar region on attempting to rise from bed in the morning. She had had a previous attack of lumbago which confined her to bed for three weeks (under the care of an osteopath who informed her that she had dislocated her sacro-iliac joint!). There was a tender spot just external to the right sacro-iliac joint, and as the case was one of moderate severity I tried the injection of 5 c.cm. of normal saline solution. Marked relief followed, but only lasted a few hours. An injection of quinine was, however, followed by complete relief, and two days later she was able to travel. A month later she wrote to tell me that she had had no further pain and was perfectly well.

It seems to me that a method at once so simple and so safe ought to be generally known and that it must have extensive applications. I have little doubt that it would be equally effective in those similar cases of torticollis and pleurodynia where a localized tender spot is always a marked feature.

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THE EFFECT OF PARATHYROID ON THE BLOOD SUGAR CURVE AFTER INSULIN.

BY

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WINTER AND SMITH have recently reported[1] that when insulin and parathyroid are injected simultaneously into rabbits convulsions (due to reduction of the amount of sugar in the blood) ensue in a much shorter period and with a much smaller dose of insulin (one-third to one-fourth of the normal dose). I applied these results to the human subject, and found that parathyroid was almost, if not quite, as efficacious when given by mouth, and in the cases reported below this method was used. The procedure in all the cases was the same. The patient was not allowed any food beyond clear soup for five hours before injection. The parathyroid and insulin were administered, and the first blood taken within five minutes, and blood-sugar estimations were carried out hourly from that time to the end of the observation period. No food was given until after the last estimation.

CASE I.

H. S., male, aged 36. Diabetes diagnosed two years ago. He was treated on a modified Allen diet, but was careless, and persistently overstepped it by small amounts. He had got worse of late, and developed marked ketonuria in July, without any alteration of diet.

Twenty units of A.B. insulin given alone. Blood sugar: 0.3[illegible], 0.265, 0.227, 0.162, 0.155, 0.187, and 0.234 per cent.

Twenty units of A.B. insulin with four 1/10 grain parathyroid tablets. Blood sugar: 0.329, 0.257, 0.196, 0.141, 0.118, 0.102, 0.1[illegible], and 0.169 per cent.

CASE II.

J. A., male, aged 45. First symptoms in February, 1922. Was thirsty, and lost over 2 st. in weight. Was treated on old lines with codeine, and restriction of bread. Improved for a few months, but lost ground again towards the end of the year. Admitted to the infirmary in January, and was given three doses of insulin, and put on to the Allen dietary. Was a bad patient and did not adhere to his diet. Returned again in September, and was treated with insulin.

Twenty units of insulin given alone. Blood sugar: 0.342, 0.2[illegible], 0.256, 0.201, 0.216, 0.238, and 0.277 per cent.

Twenty units of insulin with twelve 1/10 grain tablets of parathyroid. Blood sugar: 0.329, 0.236, 0.195, 0.149, 0.125, 0.094, and 0.081 per cent.

CASE III.

H. R., female, aged 55. Chronic case. Had had glycosuria for four and a half years to her knowledge. Had been thirsty occasionally, but main complaint was pruritus. Present weight 13 st., had been 17 st. The blood sugar curve was definitely diabetic.

Twenty units insulin given alone. Blood sugar: 0.362 per cent., missing, 0.214, 0.156, 0.172, and 0.224 per cent.

Twenty units insulin with ten parathyroid tablets. Blood sugar: 0.339, 0.246, 0.182, 0.125, 0.107, 0.091, 0.088, and 0.122 per cent.

CASE IV.

L. S., male, aged 23. In January this year he showed typical symptoms. He was treated by a modification of the Allen diet and improved greatly. In July he felt worse again, and it was found that his tolerance had dropped from 95 grams carbohydrate to 60. He was readmitted, and given insulin, with marked benefit and slight increase in weight. Unfortunately, being worried about the necessary expense, he dropped the insulin, and became worse again.

Fifteen units insulin given alone. Blood sugar: 0.284, 0.243, 0.[illegible], 0.153, 0.167, and 0.202 per cent.

Fifteen units insulin with six parathyroid tablets. Blood sugar: 0.322, 0.246, 0.191, 0.153, 0.124, 0.104, 0.118, and 0.143 per cent.

CASE V.

M. M. W., female, aged 26. Diabetes was diagnosed at Christmas, 1922, but she had symptoms for a considerable time previously. Refused to come into hospital until quite recently, and had had practically no treatment hitherto.

Fifteen units insulin given alone. Blood sugar: 0.410, 0.326, 0.[illegible], 0.277, 0.229, 0.242, and 0.283 per cent.

fifteen units insulin with ten tablets of parathyroid. Blood sugar: 0.356, 0.288, 0.231, 0.177, 0.143, 0.119, and 0.106 per cent., after a four hours' interval, during which she was given 10 grams of carbohydrate, 0.259 per cent.

From the above cases it is evident that parathyroid extract exerts a very definite action on the blood-sugar curve after exhibition of insulin. Whether this will be of any importance as regards treatment is not yet clear. Parathyroid alone does not appear to have any action on the blood sugar; such changes as have been noticed could easily be explained as the result of starvation.

Further investigations are in progress to ascertain the therapeutic possibilities of the combination.

I am indebted to Professor W. E. Hume for Case ii.

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British Medical Association.

PROCEEDINGS OF SECTIONS AT THE ANNUAL MEETING, 1923.

SECTION OF NAVAL AND MILITARY HYGIENE.

Surgeon Rear-Admiral Sir PERCY WILLIAM BASSETT-SMITH, K.C.B., C.M.G., F.R.C.S., R.N.(ret.), President.

RECENT CHANGES IN FRACTURE TREATMENT.

BY

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(With Special Plate.)

I HOPE you will forgive me if I say at the outset that this extremely important branch of orthopaedic surgery has never, in my opinion, received adequate attention in our medical schools. The unsatisfactory results of the treatment of fractures which consequently occurred in practice once prompted a celebrated surgeon to declare to his class: "Bones are not filled with marrow, but with base ingratitude."

When I was a student I remember the late Professor Thiene of Edinburgh advising us, in one of his lectures, to pass along our fractures to rivals practising on the opposite side of the street. In this sadly humorous manner our distinguished teachers warned us, at the earliest possible moment, that fractures would often prove difficult matters to deal with, and that, even in their skilful hands, the results were not always satisfactory. They were, of course, speaking of the treatment of fractures on what we now call "the old lines."

The very commencement of the twentieth century, however, marked an epoch in the history of fractures, for Professor Roentgen's discovery of *x* rays in 1895 and its application to the study we are now discussing wrought a wonderful change in our methods of treatment. *X* rays enable the surgeon to see the actual condition of the fractured bone, and the radiograph is to the orthopaedic surgeon what the ophthalmoscope is to the ophthalmologist and the cystoscope to the urologist. By its correct application he gains information as to the true state of affairs in the condition with which he is dealing, analogous, in diagnostic value, to the exploratory laparotomy of the abdominal surgeon. Still more recently the experiences of the war subjected the accepted modes of treatment to a supremely severe test, exposed their weaknesses, and forced us to evolve new methods as well as improve the old.

Surgical specialists, and others who have taken a special interest in fractures, work under ideal conditions for obtaining the best results, for the former—by holding hospital appointments—and the latter—by private enterprise—are in possession of the essential first-class *x*-ray equipment and a sufficiently varied selection of splints to assist them. To these the remarks I am about to make do not apply. They chiefly concern the practitioner who is not conveniently near an up-to-date *x*-ray apparatus and who lacks a free choice of splints.

Without good *x*-ray plates or films, however, it is impossible to be sure of obtaining the best results, because a great variety of pathological details may be learnt from a careful study of them, for instance:

1. The presence of a fracture.
2. Its variety and the position of the fragments.
3. A coexisting dislocation of or other injury to a joint.
4. The presence and situation of gas gangrene and of air in the soft parts.
5. The formation and character of callus and the solidity or otherwise of new bone formed.

The condition should be studied from the original films or plates and, preferably, when dry. In a print most of the minute details will be less apparent. The surgeon in charge of the case should himself examine the plates first and diagnose the pathological conditions existing. He may then consult an expert radiologist and see how far their readings coincide. The surgeon who first reads the radiographer's report and then studies the photograph is less likely to acquire the power to perceive accurately the details of abnormalities present.

I would like to say a few words about the method of taking *x*-ray photographs.

1. Antero-posterior and lateral views should always be taken whenever possible, and stereoscopic pictures should only be relied upon in those situations which are inaccessible from two planes—for example, where the limbs join the trunk.

2. If a fractured limb be properly splinted, either externally by the approved method, or internally by plating, it can be *x*-rayed without the slightest alteration taking place in the position of the fragments. If the proceeding causes the patient any pain it is evidence of inefficient splinting.

3. In operation cases no more dressing than is consistent with aseptic safety should be in the neighbourhood of the injury at the time it is photographed, as the more material the rays have to penetrate the less clear the detail of the picture will be. On this account the sectional dressings are very suitable as, by their use, a minimal amount of dressing is placed between the limb and the supporting flannel bands.

4. When the limb is *x*-rayed it is also advisable to replace the metal clips which secure the supporting flannel bands by sterile safety-pins, otherwise the shadow thrown by the clips in the lateral view may obscure important features of the picture.

5. By noting the positions of these safety-pins and by placing some parallel to and others at right angles to the side bars of the splint it is possible to localize on the surface of the limb the position of the particular displacement, foreign body, or fragment of bone, information which will help considerably in deciding how to deal with it.

6. Whenever possible the photograph should include a view of one or more standard bony features, such as the trochanters, patella, etc.

7. The most convenient and economical size of photographic plate for the long bones of the lower limb is one measuring 15 by 7½ inches.

8. In the early stages of the treatment of a fractured limb it is essential to have a mobile *x*-ray plant which is capable of taking photographs with the patient in his bed and without interfering in any way with the extensions.

If such a mobile plant were available, and placed at the service of any practitioner who required it, in my opinion it would be a great advantage to the patient and profession.

THOMAS'S SPLINT.

Of all the forms of fracture-treatment apparatus which were called upon to stand the supreme test of the great war, it is the universal opinion of the surgeons who went through that ordeal that Thomas's splint alone fulfilled all requirements. In the earlier stages there were many of our profession who had no recollection of ever having seen a Thomas's splint used in the treatment of a fracture, although, it should be noted, these did not include any who had studied under the teaching of Sir Robert Jones.

Professors of surgery to-day cannot say enough in praise of the incomparable advantages of Thomas's splint over

any other in the treatment of fractures of the lower and upper extremities, for it is the only splint which enables the surgeon to apply in a perfectly efficient, simple, and satisfactory manner the all-important principle of extension. To some medical men the name "Thomas" was only associated with bone-setting and quackery, when it should have brought at once to their minds a genius who, by his invention of the "Thomas knee-splint," produced the greatest mechanical non-operative advance in the treatment of fractures which any man has added to our surgical equipment.

I have frequently noticed that patients erroneously associated this splint with the famous hospital of the same name, although Thomas the surgeon was in no way connected with that institution; but I feel convinced that the work of Thomas, which has been the basis of all modern success in the treatment of fractures, which has so mitigated pain and saved limbs, and which has so averted bony, nervous, vascular, and muscular troubles, will gain for that brilliant surgeon full and complete recognition as long as any records exist.

First-Aid Treatment.

Efficient first-aid treatment is of the utmost importance to the patient, and this necessitates—(1) training of first-aid workers; (2) supply of suitable apparatus.

The beginning and the end of the treatment of a fracture of a long bone is—(1) to replace the broken ends at the earliest possible moment; (2) to keep them in a position until Nature has joined them together; and (3) to maintain the nutrition and function of the soft parts by massage, electricity, etc.

The reduction of fracture displacement can usually be achieved by manipulation—that is, by persuading the broken ends of the bone to retrace the unnatural path they have taken; and this is effected by making one fragment a fixed point, then bringing the other into its correct anatomical position and keeping it there by exerting a steady, even, and never relaxed pull. This is the fundamental rule which underlies the efficient treatment of all fractures of long bones, and it is in this way alone that the tragedies of shortened and otherwise deformed limbs can be averted. The proper time to apply this extension to the limb is on the spot where the wounded man fell on the battlefield, or the civilian was run over in the street, and not at the regimental aid post or field ambulance in the one case, or in the city hospital in the other. This can be done with ease by means of Thomas's splint, and I wish to emphasize this point all the more because I notice that in the official St. John Ambulance manual *First Aid to the Injured*, 1921, published three years after the war, there is no mention of Thomas's splint or the way in which it is applied. Police, railway companies, institutions, and many other public bodies which are interested in training in first aid, accept this manual as the standard work upon which to depend for guidance, and it follows that, in the absence of any reference to Thomas's splint, a vast number of first-aid workers are never trained in the use of the only splint which was found of universal and inestimable value in the great war.

I shall now ask your indulgence while I describe the first-aid treatment of, say, a fracture of the middle of the femur, as a typical example of the principles involved.

Each first-aid party should carry a Thomas's knee-splint. This appliance consists of an oval iron ring, united obliquely to a length of round iron which forms the side-bars and the end of the splint. The iron ring is well padded and covered with leather. The splint can be used on either leg. It can be carried conveniently and comfortably by threading the closed stretcher through the ring of the splint and tying the side-bars to the poles. Two men are required to apply the splint, and for the sake of clearness I shall refer to these as the "operator" and the "assistant."

The operator places his right hand round the heel of the injured leg and, while exerting an even steady pull on the leg and gently lifting it, he uses his left hand to support the leg at the seat of the fracture. The assistant then carefully threads the ring of the splint over the foot and, with his right hand, grasps the ankle, takes the extension on the leg, and thus releases the operator's right hand. The assistant runs the splint up the leg until the ring reaches the operator's left hand, when he passes his left hand through the ring and relieves the operator's.

The operator now controls the splint which he pushes up the leg as far as it will go—that is, until the ring rests against the bony prominence of the tuberosity of the ischium.

Leaving the splint and leg in charge of the assistant, the operator prepares a mechanical means of maintaining extension. He takes a pointed metal pin or skewer, about 12 inches long, and passes it obliquely through the heel so that the skewer lies between the sole of the foot and the sole of the boot. The correct angle is attained when the outer end is about 1½ inches nearer the toes than the inner end. When in position this "extension pin" rests on the side-bars of the splint and allows the limb and foot to be in external rotation. A piece of bandage or tape is attached to each end of the pin, and these are taken one under and the other over the side-bars and tied in a V at the end of the splint (see Fig. 1).

When this manœuvre is completed, the assistant, with his right hand, keeps the end of the splint raised so that the leg is clear of the ground, and, with his left hand still supports the site of fracture. The operator takes a 6-inch bandage and, having fastened one end to the outer side-bar of the splint near the ring, passes it from side to side underneath the limb, and alternately over the inner and outer side-bars, until the whole limb, supported by the bandage, is comfortably suspended between the side-bars of the splint.

The patient can now be lifted on to the stretcher without danger of further injury to the limb. This done, a suspension bar should be applied to the foot of the stretcher and the splint suspended from it (see Fig. 2).

What has been effected is this: The ring, pressing against the ischial tuberosity, fixes the upper fragment of the fracture. The side-bars and the end of the splint being in one rigid piece, it follows that the traction put on the foot by the pull exerted between the extension skewer and the end of the splint must draw the lower fragment away from the upper in the long axis of the limb, thus making it impossible for further shortening to occur. The force required to reduce a fracture of the femur and maintain the ends of the fragments in apposition is very great, especially in the case of a simple fracture, and should only be applied when the patient reaches the hospital or other place where he is to receive prolonged treatment. In the first-aid stage all that is aimed at is the fixation of the fragments and not necessarily complete reduction, for if a very strong pull be exerted on the foot through the boot ulceration and possibly gangrene may result.

For the purpose of transport, the leg is now fixed more securely in the splint by fitting pads of cotton-wool in the spaces between the splint and the sides of the knee and ankle and applying a bandage over all, so as to include the side-bars of the splint, the limb, and the padding. The case is now ready for removal to a hospital or to the patient's home for further treatment.

Too much emphasis cannot be laid upon the fact that careful and correct first-aid treatment given in the manner described, immediately after the accident, will ensure that the fracture and the patient will come before the surgeon in the very best possible condition for further active surgical treatment.

Transport of a patient with a fractured bone insecurely fixed will certainly add to his pain and therefore increase the shock, and may also lead to any of the following serious complications:

1. The muscles, blood vessels, and nerves are liable to be lacerated and a closed fracture may be converted into an open one.
2. Manipulation is more painful.
3. Extension, which is absolutely essential, cannot be safely applied in sufficient degree to a limb which is teeming with extravasated blood, for the application of extension to a limb the vitality of which is already endangered by distension may determine the onset of gangrene. Ne

useless, our aim must be to reduce the displacement without delay.

4. Another serious complication is the entanglement of the ends of the fragments in the surrounding muscle and fascia. When this cannot be rectified by manipulation, it constitutes the only condition which can prevent the reduction of displacement by mechanical means and which necessitates reduction by open operation.

End-treatment.

From the point of view of treatment, a fracture of a long bone must be considered not only as a solution of continuity of the osseous matter involved, but also as a lesion possibly affecting skin, muscle, nerves, bone, and joints in the vicinity.

The ideal treatment of a fracture should have for its object complete anatomical reposition of the injured tissues and complete restoration of functional power to the affected part. It should therefore be the surgeon's aim to produce as the end-result of his efforts a limb which corresponds to its uninjured fellow both in function and appearance. The same general principles underlie the treatment of fractures of all long bones, and in their treatment the same results should be sought after.

The war produced an over-abundance of all varieties of fractures, open and closed, complete and incomplete, and these again were transverse, oblique, spiral, impacted, non-impacted, multiple, and complicated with every imaginable combination (see Fig. 3).

From this colossal collection of material we, from 1914 onwards, gradually gained a vast and unique experience, which definitely proved the necessity for prolonged extensions, brought about the rebirth of Thomas's knee-splint, and improved it with many additions, such as extension prop, footpiece, skate, etc., necessary for the correct alignment of the fragments, to quote only a few of the many advances which now ought to be common knowledge.

When a man with a fractured femur is lying flat on his back the sound limb and the upper fragment of the broken bone are rotated outwards at the hip to an angle of about 40 degrees. Considering this fact, it is extraordinary how large a number of fractures of the leg bones have been treated with the foot in a vertical position, with the result that the lower fragment is rotated inwards on its long axis, and when union occurs and the patient resumes the erect position the lower part of the limb and the foot are markedly rotated inwards.

In each case the actual amount of external rotation of the upper fragment can be estimated with considerable accuracy by studying the position of the small trochanter in the *x*-ray plates. The photograph should include the upper ends of both femora, with the foot of the uninjured limb pointing vertically upwards.

The information gained from this position of the small trochanter is also useful for another reason. It is very occasionally found that, in fractures of the middle third of the femur, the damage done may be such that muscular action counteracts the natural tendency of the limb to rotate outwards. In some cases it may just neutralize this tendency, and, in this position, the upper fragment will correspond to the vertical position of the foot. In other cases this muscular action may be still more pronounced and may actually produce internal rotation of the upper fragment corresponding to the foot being rotated inwards.

In every case the *x*-ray photograph to which I have referred will make the position quite clear to the surgeon, and he will be able to arrange accordingly the angle at which the foot is to be splinted.

Permanent extension is obtained by the use of glue, screws, or callipers. With careful attention glue will be found to meet requirements in about 50 per cent. of cases, but in some it will not give the necessary extension without blistering, and consequently screws or callipers must be employed.

In my experience the most satisfactory means of maintaining prolonged continuous extension in the treatment of a fracture (especially in the case of the lower limb) is by exerting adequate mechanical traction upon screws inserted into the tibia, radius, and ulna.

The operation is performed without removing the leg from the Thomas splint. The skin and the side-bars of the splint having been sterilized with 3 per cent. picric acid in methylated spirit, a longitudinal incision, half an inch in length, is made down to the bone, on the inner side of the tibia, halfway between the anterior and inner borders. The tibia is then drilled in an outward direction, the drill being held so that the point is inclined slightly towards the foot. It passes through the hard bone and medulla and just far enough to bite on the medullary surface of the hard bone on the opposite side of the canal. The drill is then removed, and a round-headed steel screw 2½ inches long by 1/6 inch in diameter, held in Lane's screw-holding forceps, is placed in the hole in the bone and screwed home until it bites on the far side of the medullary canal (see Fig. 4).

The second screw, for the outer side of the tibia, requires an incision made nearer either to the foot or the knee than the first screw, and also nearer to the anterior border of the tibia. This incision is made in a transverse direction and the small amount of intervening muscle is cut across. The bone is then drilled and the screw inserted in the same way as described for the screw on the inner side.

The wounds are covered with a dry gauze and 3 per cent. picric acid dressing, which is punctured so as to allow the heads of the screws to pass through, and secured in position by a bandage. As soon as one or two turns of this bandage have been applied the extension tapes are placed in position. These consist of a double length of sterile tape, attached to an oval brass ring which is placed over the screw, and the remainder of the bandage is then applied so as to include these rings. The tapes are then tied over the foot-extension prop, in the same way as gauze extensions are fastened.

The nearer the brass rings are to the skin, and therefore to the bone, the more effective will the extension be, and there will also be less tendency for the pull to bend the screws by leverage. The upper parts of the tapes are covered with vaseline to prevent the picric acid from rotting the tape and save the screws from getting rusty.

It has been stated that traction should not be taken from the leg alone, on account of the danger of stretching the ligament of the knee-joint and producing a loose knee. This danger is quite theoretical, and a stiff knee will result if passive and active movements are not commenced at the proper time.

Having now complied with the first essentials in the treatment of a fracture of a long bone—namely, to apply extension below the seat of injury and to immobilize the limb—the next question for the surgeon to consider is the plan by which the patient may be most comfortably circumstanced for a prolonged stay on his back in bed, having in view the fact that he must be easily accessible for nursing and dressing purposes without interfering with the line of extension and consequent danger of alteration in the position of the fragments. This question of the physical comfort of the patient is all-important, for the more comfortable he is the more quietly and contentedly he will lie. The risk of disturbance of the fragments will be proportionately less and the organization of the soft parts and the formation of callus will be proportionately expedited. The practical way to obtain all these advantages is to suspend the splint and limb (see Fig. 3).

Reference has already been made to suspension of the limb, in the earliest stages of treatment, by attaching the splint to a suspension bar which fits over the sides of the stretcher, but a rather more elaborate apparatus is desirable when the patient is put to bed in the place where the end-treatment is to be carried out.

Summary.

To sum up these remarks on non-operative treatment, I would like to repeat the following points:

1. The main object to be kept in view is union with exact apposition of the fragments. The importance of this cannot be exaggerated, for, although one cannot even then say that perfect function will be restored, and although every surgeon has seen cases in which good function is associated with defective alignment, yet

statistics prove undeniably that good functional results will follow in direct proportion to the success which has been attained in the endeavour to restore a broken bone to its original natural form. The finding of the British Medical Association Fracture Committee in 1912 was that 90 per cent. of good anatomical results were followed by good functional results, and my experience entirely supports that finding.

2. Each new fracture is a fresh problem, and its diagnosis and treatment cannot be controlled by a set of rules which were formulated, and did excellent service, at a time when the surgeon's vision had to be projected through his finger-tips. As I have said, *x* rays must be used at every stage if one is to be certain of obtaining the best results.

3. When the surgeon has to deal with a complete fracture he knows that the fragments can be displaced in any of the three dimensions of space. Unless he selects a splint which will permit of these fragments being replaced through these dimensions he cannot expect a good result from his treatment. This requirement alone disposes of such spints as Liston's, McIntire's, Cline's, internal right-angled splints for the arm, and plaster-of-Paris. In my opinion these and similar forms of apparatus ought not to be used, and should be discarded from our equipment for treating fractures, because imperfect results can only be expected to follow their employment.

As I have already said, Thomas's splints fulfil all requirements, with such modifications in minor details for the arm and the leg as are necessitated by the anatomical differences in the limbs. These splints will permit of the indispensable extension; they correct the main displacement, and their side-bars allow the surgeon free access to the site of fracture, so that he is able, with the aid of *x* rays, to complete any replacement of the fragments which the splint itself has not already accomplished. Thus, if after extension has been applied the *x*-ray photographs reveal the presence of lateral deformity, he can move either fragment in the required direction by passing a loop of bandage round the limb at the level of the displaced piece of bone and gently applying traction until the lateral error is corrected. To maintain the correct position the bandage can then be fastened to the side-bar.

Antero-posterior displacement can be corrected by a transverse band passing from side-bar to side-bar either in front of or behind the limb, according to the direction in which it is necessary to move the fragment.

No other splint of which I have knowledge will give the surgeon such absolute control over the fragments.

Open Operation.

When it is difficult or impossible to reposition the fragments by non-operative means, and it is necessary to deal with the case by open operation, I use Sir Arbuthnot Lane's technique.

Plating.

Using very light plates and splinting the limb at the same time give very satisfactory results. I make it a practice to use plates only as temporary internal splints, and aim at removing them at an early date, although this will naturally depend upon the bone that is fractured (see Figs. 5, 6, 7, 8, 9).

In the case of the tibia, applying the plate to the subcutaneous surface of the bone, and removing it on about the seventh day by opening the original incision, has given good results. For complicated fractures long plates are used, and these I leave in position for a month or six weeks, but subject to *x*-ray readings indicating good callus formation (see Figs. 10, 11, 12, 13).

Personally, I am not in favour of leaving plates permanently *in situ*, as they are liable to cause trouble sooner or latter.

Wiring.

Wiring a fracture has certain advantages over plating:

1. A smaller incision is required, less tissue is damaged, and less detachment of muscle from bone is necessary.

2. Wire is more easily applied and removed.

3. A very much smaller foreign body is introduced into the tissues.

4. Wire presses on a very much smaller area of bone and is therefore less likely to interfere with the blood supply of the bone in its neighbourhood (see Figs. 14, 15, 16, 17).

5. It can be used and has produced good results in septic cases in which plates cannot be employed, and in some cases wiring has been known to save limbs which would almost certainly have been lost if treated in any other way.

6. Wiring combined with splinting makes it easier to correct the deformity and maintain the fragments in perfect anatomical position.

Bolting.

In certain complicated cases, especially in the neighbourhood of joints, it will often be found that wiring and plating are not sufficient to meet the case. In such cases I have found it more satisfactory to immobilize the bone fragments by means of a bolt which can be used alone or in combination with Lane's plates.

The accompanying illustrations (Figs. 18 and 19) show an L-shaped fracture into the knee-joint treated in this way.

SOME GENERAL REMARKS ON SURGERY IN THE ROYAL NAVY.

BY

SURGEON CAPTAIN D. W. HEWITT, C.B., C.M.G., F.R.C.S., R.N.

SURGERY has been practised in the Navy ever since the Navy began to exist; anyone who visits the old *Victory* here can see for himself the operating table in the cockpit where amputations were performed at the battle of Trafalgar, and where Nelson lay dying. It is only within comparatively recent years, however, that "set" operations have become the daily routine in naval hospitals.

Although Walter Reid had operated for aneurysm some time previously, the year 1900 really marked the birth of modern naval surgery. Previous to this men requiring operative treatment were invalided and transferred to civil hospitals.

The records of Haslar, the oldest of our naval hospitals, bear evidence that it was in 1900 that the first serious abdominal operations were performed; and it is a point of interest to note that one of the hospital sick berth staff was the first patient to have his appendix removed by a naval surgeon in a naval hospital. The actual amount of surgery done for some time afterwards varied with the initiative and courage of the staff of the hospital.

The Navy has always been a conservative service and the medical branch is no exception. Every innovation had therefore to be introduced with the greatest care and tact and the pioneers had to guard against the least suspicion of carrying out experiments on the personnel of the fleet. They could only follow slowly, therefore, in the wake of the civil hospitals, and before attempting anything new had to be in a position to prove that there was ample justification for any surgical measures they might adopt—and, more than that, they could not afford to have failures. All the more credit, therefore, was due to them for their courage and initiative. For instance, during those early years the administration of a general anaesthetic was a most important function at which the medical officer in charge of the hospital had to be present.

The naval surgeon has always, perhaps, occupied a unique position in having to grapple unaided with all sorts of surgical difficulties in all parts of the world. He may find himself in a small ship off the west coast of Africa, or up a river in the wilds of China, suddenly confronted with organizing single-handed arrangements for an expedition miles inland. Dressings have to be provided, transport for the wounded arranged, and operations performed with little or no skilled assistance. It speaks well for him that he has been able so often to emerge triumphant from such difficulties.

To-day naval hospitals compare favourably, both as regards equipment and personnel, with similar civilian establishments, and the work carried out in them is practically the same. It is of a varied nature and only restricted

in type by the fact that no women or children are admitted. Although most of the surgery is of an emergency character amongst young and vigorous men, at the same time the dockyards and pensioners provide work of a different kind, and everything which comes along is now done as a matter of course.

Examination of the naval medical blue book (*The Health of the Navy*) for the year 1912 (a peace year, and therefore uninfluenced by the abnormal conditions during and after the war) demonstrated that here at Haslar 1,793 operations were performed under general anaesthesia.

The whole question of surgical treatment in the Navy is closely associated with that of hospital ships and hospital trains. All fighting ships in the Navy above a certain size carry one or more medical officers and are provided with a small hospital, called the sick bay, where the crew receive first aid and can be treated in bed for minor complaints which do not necessitate their transference to a hospital. The medical officers are assisted by male nurses, called sick berth staff, one or more according to the size of the ship. The larger vessels are also supplied with an operating room where urgent work can be done, and an *x*-ray machine. Each ship, therefore, of any size, is more or less self-contained and carries about its own small hospital with staff and equipment.

Experience has proved, however, that major cases can only be successfully and properly treated in a shore hospital or hospital ship, and that there are several reasons why it is preferable to get the patient away as soon as possible from the fighting unit.

This brings us to the question of hospital ships. Recent service in the naval hospital ship *Maine* with the Mediterranean Fleet has convinced me that a hospital ship is a most valuable asset to a fleet. She can go wherever required and form a floating hospital on the spot, where serious cases can be transferred instantly, and where skilled nursing is always available, obviating the necessity of transport to shore hospitals over perhaps rough country and in foreign lands.

The great war has had a most stimulating effect on naval surgery generally. It brought naval medical officers face to face with all sorts of new surgical conditions, and the constant association with some of the foremost surgical experts in the United Kingdom was most helpful and has left its mark on the service to-day. It is satisfactory to note that the impressions formed by several of these men, with their vast experience in civil hospitals both in the metropolis and all over the country, were very favourable to the work done by naval surgeons throughout the war. After the battle of Jutland the treatment of the wounded in some of the ships engaged was found to be so excellent that nothing further was necessary on their admission to hospital.

In naval hospitals the work is organized by the Surgeon Rear-Admiral in such a way that an experienced operating surgeon, usually a surgeon captain or a senior surgeon commander, is always on duty and available for any emergency operation. These operating officers reside in the hospital precincts, and as they have no other duties of any importance to interfere with their work operations are always carried out with the least possible delay. As an example of this, a marine who was route marching and fell out sick at 10.30 a.m. had his perforated gastric ulcer sutured before 12 noon.

It is interesting to compare the conditions under which operations take place in a naval and a civil hospital. In the Navy, practically speaking, the individual is always under the supervision of a medical officer, and it is rare to find one who is not a skilled clinician. Emergencies are promptly recognized and as promptly transferred to hospital, as there is a very complete organization for this work.

As far as the patient is concerned, he is usually a young healthy individual; he has no cares or anxieties; there is no economic question, and he usually accepts the ministrations of his surgeon in the same spirit as he accepts the orders of his captain. It is this attitude all the way through which accounts for the exceptionally favourable results which follow operative treatment, there being long series of appendices and perforated gastric ulcers without a death or any untoward symptoms. When convalescence has been established the naval surgeon is in the fortunate position that he has complete control over his patient's diet, exercise, and on the performance of his duty for so long as he considers necessary. The patient is not cast out of hospital as soon as his sutures are removed, as may happen in civil hospitals.

As the naval hospital is a convalescent home as well as a hospital, should further residence in the hospital be undesirable, the patient can be sent home on sick leave for any reasonable period; indeed, it would be difficult to imagine more ideal conditions for surgical practice, both to the patient and to the surgeon.

It is true that the type of operation is limited by the class and sex of the patient dealt with, but the operations are varied enough.

On ten days (taken at random from the operating book) we have the following:

Two laparotomies for general peritonitis following appendicitis; 4 hernias; 5 varicose veins; 2 tonsillectomies; 1 aural polypi; 2 mastoidectomies; 1 hydrocele; 1 perineal abscess; 3 appendicectomies; 2 axillary abscesses; 1 nasal polypi; 1 wiring fractured patella; 1 ventral hernia; 1 amputation of middle third of forearm; as well as 5 other operations for various forms of sepsis.

Formerly specialists were not encouraged in the Naval Medical Service; every medical officer was supposed to be capable of treating efficiently any type of case that came along. The fact that a man should try to specialize was too often considered tantamount to an effort on his part to evade sea service or to get an easy job. Nowadays all this is altered, and there are men with high and special qualifications in various branches of surgery both in shore hospitals and with the fleets. Ophthalmology, ear, nose, and throat work, and genito-urinary surgery are all under surgeons who have been carefully trained, and our *x*-ray, electro-therapeutic, and orthopaedic departments are well up to date. Dental surgery has also come in for full recognition as a separate department, and we have now several qualified dental surgeons with full equipment in our large shore establishments and hospitals, as well as afloat.

Members of the sick berth staff are trained to assist in all the departments, and as they are specially selected from this excellent and intelligent body of men they soon become remarkably efficient and are a great help to the officers in charge.

I have endeavoured in this short paper to demonstrate to those of you who are unacquainted with the Naval Medical Service the rapid progress of naval surgery during comparatively recent years, and I think a walk round Haslar will convince most of you that we in the Navy are not far astern of our brothers ashore.

Time does not permit me, much as I should wish, to go into the question of treatment of several surgical problems, but I should like to bring forward as subjects for discussion the treatment of two acute affections which are common in the Navy to-day, and in my opinion, are becoming more so—namely, perforating gastric and duodenal ulcers (especially as regards the draining of the peritoneal cavity), and the methods of operating in cases of appendicitis.

Finally, I desire to thank my friend and colleague, Surgeon Commander J. R. Muir, M.B., R.N., for helping me in this paper.

SOME CONSIDERATIONS IN THE ESTIMATION OF PHYSICAL EFFICIENCY.

BY

GROUP CAPTAIN MARTIN FLACK, C.B.E., M.B., M.A.

[ABSTRACT.]

IN 1920 the report of the Ministry of National Service showed that, by the ordinary methods of medical examination, there was, in round numbers, in respect of 2,425,184 recruits, a shortage of 825,000 Grade I men, an excess of 61,000 Grade II men, the enormous excess of 575,000 Grade III men, and 190,000 Grade IV men. Nor were the results any more satisfactory as regards youths of 18.

In the report of the War Office Committee on Shell Shock, 1922, it is recommended that only fit men (Grade I) as judged by the pre-war standard should in future be enlisted into the regular army. It is, however, obviously of great importance to be able to estimate not only a man's physical condition at the moment, but also the likelihood of his manifesting bodily endurance when exposed to physical strain. This is particularly the case in respect of officers of the Royal Air Force; at the end of 1916, for instance, the carrying of aerial warfare to higher altitudes imposed additional strain on pilots, and breakdown became more frequent. In order to ascertain whether such an estimate could be made by means of medical examination, a special investigation was undertaken under the auspices of the Medical Research Council, and it was shown to be possible to differentiate the fit man who is likely to endure from the man who either will not stand strain well or will invariably break down under it. These results form in large part the basis of the methods of selection in the Royal Air Force to-day, and confirmatory evidence of their value is continually forthcoming. It is now possible not only to exclude those who are physically unfit for the arduous duties of flying and combatant service, but also by periodic examination to withdraw from service such as are in need of rest, at a stage before real breakdown has occurred.

Full details of the routine tests now in use, other than those employed for the elucidation of special conditions, are given in the official Air Ministry publication dealing with the medical examination for the Royal Air Force. These tests in no way displace the general clinical examination, but merely serve as adjuncts thereto.

The chief points to which attention must be paid in the assessment of physical efficiency and bodily endurance are—(1) respiratory efficiency, (2) circulatory efficiency, and (3) general nervous stability as regards control through the centres of respiration and circulation, and cerebral and psychical control.

Respiratory Efficiency.—The practice of measuring the upper chest expansion on inspiration should be abolished or at least combined with a measurement at the level of the floating ribs, which is more important. Correct inspiration consists in the contraction of the diaphragm attended with an upward movement of the lower ribs, and is the type prevalent in individuals who possess the greatest bodily endurance. If inspiration be properly performed correct expiration naturally follows, but it should be borne in mind that expiration is under muscular control, and it has been shown that it is on the expiratory rather than the inspiratory side that individuals tend to fail as the result of strain.[1] With regard to the value of spirometry in the assessment of physical fitness there is no doubt that the usual instrument gives very inconstant results, and there is, moreover, still a divergence of opinion as to what constitutes the normal vital capacity. It is, however, a distinct advantage to be able approximately to estimate the vital capacity, and for this purpose the author compares Dreyer's tables with one prepared from the results of Cripps, Greenwood, and Newbold. In this way an idea is obtained as to what vital capacity should be for the standing height, sitting height, weight, and chest circumference of the individual in regard to Dreyer's figures. The vital capacity should equal his Class A, or, preferably, exceed this class by 300-500 c.cm. When the vital capacity falls much below this, respiratory insufficiency is certainly present. Observation proved that officers who could not fly high possessed a small vital capacity, and especially those who were suffering from flying strain. In the latter the diminution in vital capacity was shown to be due to an inability to expire sufficiently to empty the lungs to the full extent. The fit individual is possessed of a good vital capacity mainly because he has this power of adequately emptying his lungs by expiration. In the individual who is respiratorily inefficient the vital capacity is considerably reduced by prolonged physical effort and his "ventilation capacity" is decreased (residual air increased, and the ratio of vital capacity to residual air diminished). Thus the respiratorily fit person is one who, in response to physical effort, is able to maintain his "ventilation capacity" at a relatively high level over the whole period of performance. Diminution in ventilation capacity further involves a relative increase of carbon dioxide and decrease of oxygen in the alveolar air.

The partial pressure of carbon dioxide and oxygen play a considerable part in determining the time over which an individual can hold his breath.[2] In the fit subject it requires a considerably greater diminution of the partial pressure of oxygen to induce symptoms of respiratory instability and circulatory embarrassment (violent desire to breathe, quickened heart rate, increased blood pressure, congestion of the face) than in one who is suffering from fatigue or lowered efficiency. Similarly with an increased percentage of carbon dioxide. Both the 40 mm. Hg test and the breath-holding test may, therefore, be taken as affording indications of the ventilation capacity of the individual and of his susceptibility to changes in the alveolar partial pressures. Stable control by the respiratory centre is an important factor in bodily endurance, and the above tests are of value in assessing respiratory efficiency in this respect. In an individual of adequate respiratory capacity the time of holding the breath without undue discomfort is, in the breath-holding test, 69 seconds; in the 40 mm. Hg test, 55 seconds. The expiratory force test is of value in showing the condition of the expiratory musculature; generally respiratory insufficiency is indicated when the reading falls below 110 mm. Hg, and it is certainly significant of general physical inefficiency when it fails to reach 80 mm. Hg.

Circulatory Efficiency.—A pulse rate, at rest, above 90 (not due to temporary excitement) is characteristic either of nervous instability or of physical insufficiency. As regards the latter, it was found, for instance, that by special exercises for one month the average standing pulse rate of a number of "weedy" recruits was reduced from 95 before training to 79 after training. A quick pulse rate (96 or above) is frequently an expression of nervous instability, particularly a quick pulse associated with a respiratory rhythm. Such persons are not, generally speaking, suitable for arduous service duties, and frequently break down.

The arterial pressures afford important information. If in the absence of any clinical signs of disease in a person of 20 to 25 years of age, the systolic and diastolic pressures are persistently high and the pulse pressure exceeds 50 mm. Hg (for example, SP 160, DP 104, PP 56), the individual may be regarded as having a "nervous temperament" and as not likely to stand great physical and mental strain. In certain cases such pressures are due to excessive indulgence in alcohol over a prolonged period, and the other tests for physical efficiency, particularly those for nervous stability, will then be found to give unsatisfactory results. As regards low diastolic pressures, one below 70 mm. Hg, combined with a pulse pressure of more than 50 mm. Hg, is indicative of lack of physical stamina for flying duties. Such subjects are particularly liable to faint in the air, and the same holds true to a less extent as regards physical endurance on the ground. The fit individual is one in whom the margin of fall of the diastolic pressure is in the neighbourhood of 30 mm. Hg (that is, a diastolic pressure of 80 mm. Hg) before the fainting pressure is reached. In subjects with a low diastolic pressure a contributory factor of great importance, and one that is insufficiently appreciated, is the accumulation of blood in the abdominal veins in the upright posture. In this condition the systolic output is reduced and becomes insufficient to maintain an adequate diastolic pressure, although the arterial systolic pressure remains normal. As affording information of this condition the pulse response during the 40 mm. Hg test is of great service. In a fit subject there is little alteration of the initial pulse rate over a period of fifty to sixty seconds, and the arterial pressures are not greatly raised (30 to 40 mm. Hg to 160 to 170 mm. Hg). In the less fit, on the other hand, the test produces a greater and more rapid elevation of the arterial pressures (for example, to 180-200 mm. Hg), while the pulse rate rapidly increases to 120-130 or more. This increase is maintained when the total rise of pressure is not abnormally high, but is succeeded by a marked and often abrupt fall of pulse rate when the arterial pressure is increased to a high point—for example, 220-240 mm. Hg, a point which appears to be constant for each individual. The fall is possibly due

reflex slowing of the heart rate owing to stimulation of the depressor nerve endings in the aortic arch through rising of the blood pressure due to the increased flow of blood to the right side, caused by the abdominal effort necessary to sustain the column of mercury.

Certain subjects display a combination of these results as regards arterial pressure readings—namely, a high systolic and a low diastolic pressure: for example, SP 150, DP 60, PP 90. Such individuals are "highly strung" as regards nervous stability and markedly inefficient as regards physical stamina. From the point of view of air work, such subjects present an interesting response to rotatory movement; when they are rotated ten times in twenty seconds the pulse is greatly increased in rate, the SP pressure rises but the DP falls, and fainting may ensue. In certain individuals who are relatively physically efficient the rotation induces a marked rise of both systolic and diastolic pressures, and such individuals are probably liable to suffer from nausea and vomiting in the air.

The abdominal wall plays an important part in counteracting the influence of gravity in producing abdominal venous congestion in the upright posture, and it is impossible to over-estimate the importance of a good-toned, mobile abdominal wall in maintaining efficient circulation and respiration, and thereby preserving physical efficiency.

When the abdominal wall is lax and ineffective the supply of blood to the heart during exercise will be insufficient, owing to the large abdominal pooling of blood, and the heart will therefore, to meet the demands of the body, be obliged to pump a relatively small supply of blood at a quicker rate. Such increased heart rate is frequently regarded as a sign of myocardial insufficiency, whereas in many such cases it is due to an efficient heart making the best use of a poor supply of blood. Such a condition is often found in persons who have returned from the tropics.

The ill effects of gravity are further counteracted by the tonic contraction of the splanchnic arterioles. Information as to the tone of these vessels is afforded by the pulse when the subject rises from the sitting to the standing posture. Generally speaking it may be taken as true that the greater the increase in pulse rate, and the more prolonged the quickened rate, the greater the insufficiency.

Circulatory efficiency may be assessed as follows: (1) A normal steady heart beating about 72 a minute, not unduly increased in rate by exercise and returning quickly to normal steady rate. (2) A pulse pressure of 40-50 mm. Hg associated with a well sustained diastolic pressure (about 80 mm. Hg). (3) Absence of abdominal pooling in the venous reservoir due to the effects of gravity on the circulation owing to poor tone of the abdominal belt of musculature.

Stability of General Nervous Control.—The importance of stability of the circulatory and respiratory centres in the maintenance of physical efficiency has been indicated above. General nervous stability plays a great part as regards bodily endurance. The tests employed in the R.A.F. are considered to be sufficient to reveal the condition of physiological or psychical control. Thus tremor is evidence of some disordered functional state. Tremors of the eyelids alone are usually indicative rather of a highly strung disposition or the result of legitimate stress, such as overwork or strain of occupation; tremors of fingers and hands rather of illegitimate stress, such as excessive indulgence in tobacco or alcohol; while tremor of both eyes and fingers generally signifies nervous instability due to a combination of the above causes. As regards the knee-jerk, a so-called brisk or exaggerated response is not in itself necessarily an indication of nervous instability, but a condition not infrequently called "exaggerated knee-jerk," attended by a convulsive movement of the whole body, indicates loss of general control, and has nothing to do with tendon reflexes. This "exaggerated knee-jerk" is usually associated with a state of anxiety, conscious or subconscious. The tests of standing on one foot with the eyes closed, and of balancing a rod on a flat board, elucidate the condition of central control rather than the condition of "muscle-sense" or "vestibular stability"; failure in them, therefore, indicates some want of afferent or efferent control.

In many instances it is the failure of the control through the medullary centres which predisposes to breakdown of the higher centres.

References.

[1] Milroy Lectures, *Lancet*, 1921, vol. ii, pp. 593, 637, 683. [2] Hill and Flack, 1909, *Proc. Physiol. Soc.*, xlviii, J.P. xxxviii, and Flack and Burton, 1922, *Proc. Physiol. Soc.*, J.P. vol. lvi.

SOME ASPECTS OF NORMALITY; WITH SPECIAL REFERENCE TO THE SELECTION OF RECRUITS.

BY

BREVET LIEUT.-COLONEL C. R. SYLVESTER-BRADLEY, R.A.M.C.

Our knowledge of the diseases to which man is subject is being added to continually, and in all probability at no period in the history of the human race has that knowledge been so complete as it is at the present time. All diseases and defects must be considered abnormal, and while our knowledge of such abnormalities is ever increasing, our knowledge of what may be styled "normal man" does not appear to have increased to the same extent. There are only a few generally accepted standards of normality, in spite of the advantages to be derived from the possession of such standards. No accurate assessment of the degree of any abnormality is possible without a standard of that which is normal. In the past we have been content to express the physical or mental attributes of the individual in such abstract terms as "good," "bad," and "indifferent."

Standards of normality are essential not only in estimating the degree of abnormality from which, as medical men, we may know an individual to be suffering: they are of importance for comparative purposes to those who have the care and upbringing of the rising generation entrusted to them; they should prove of great help in life insurance from an actuarial point of view; and they are indispensable to any scientific selection of recruits for the various arms of the fighting services.

Definition of Normality.

Before proceeding further it will be well, perhaps, to try and define what is meant by "normality," as applied to man.

When we speak of an individual having normal physique or normal mental capacity, we infer that the stature, weight, physical proportions, and mental attributes of that individual represent a normal average of the race to which he belongs. Further, it may be desirable to subdivide the races into different classes, in order to obtain a standard of normality for that particular section of the community. It is not possible to lay down standards of normality suitable to all races; a standard suitable for the native races of Central Africa would be quite unsuitable for the assessment of the inhabitants of these isles, and vice versa.

Physical Normality.

In the past physique has been regarded as one of the most important factors with reference to the selection of recruits for a fighting force, and in ancient warfare involving hand-to-hand fighting there can be no question that the side with the better physique possessed the advantage; but with the advent of long-distance projectiles this advantage has been minimized, whilst at the same time the "frightfulness" of modern warfare, with its accompanying nervous strain, has focused attention on the importance of psycho-physical and psycho-physiological characters. The soldier nevertheless remains a beast of burden, compelled at times to carry a weight of equipment far in excess of any load he has been accustomed to in civil life, and in addition he may be called upon to undergo fatigue, extremes of temperature, and climatic exposure under the most favourable conditions for contracting disease.

The soldier of the future must be not only physically normal but psychologically normal.

When attempting to formulate a standard of physical fitness for the enlistment of recruits there are certain points which must be borne in mind. Our standards of physique must be framed so that the average trained soldier approximates the normal physique of the mass population from which he has been recruited. If we try to select only those recruits who are above the average in physique, we shall find that we are involved in two difficulties—first, that an insufficient number of recruits will be forthcoming; and secondly, that better physique has been obtained at the expense of medical efficiency. These two points require to be considered in somewhat greater detail.

The average stature of the general population, according to Sir Arthur Keith, is approximately 67½ inches, and according to the same authority some 50 per cent. of the population have a stature ranging between 65½ and 69½ inches. Unfortunately we have no available statistics for our own forces of the relationship between stature and disease; but some exceedingly interesting and instructive figures showing the proportionate measurements of recruits and soldiers in the late war who suffered from special diseases have been prepared by the United States Army Medical Service[1] and have an important bearing on this subject.

It was found that the average stature of soldiers suffering from varicose veins, varicocele, pulmonary tuberculosis, goitre, haemorrhoids, and all heart troubles was greater than that of the general population. This fact leads one to the conclusion that an increase in stature above the normal is not necessarily followed by a corresponding increase in the size and efficiency of such important internal organs as the heart and the lungs. Furthermore, those who were markedly under the average stature of the general population showed a greater tendency to disease the result of faulty nutrition and development, as evidenced by the larger percentage of cases of flat-feet, defective teeth, defective vision, etc.

It is my opinion, therefore, that, other things being equal, the physical efficiency of any body of men will be governed to a large extent by the ratio of their individual height to the normal average height of the general population. A body of men in which the majority of individuals approximate 66.5 inches will, other things being equal, be physically and medically more efficient than a similar body of men in which the height of the individual ranges from 60 to 72 inches or more. I would go further and state that the normal man of from 66 to 69 inches in stature has a better expectation of life than the man of six feet and over.

The standard of height for the recruit on enlistment must be fixed with reference to his age and his probable ultimate height as a soldier; it may also be necessary to use the height standard as a means of regulating the influx of recruits according to the supply and demand; nevertheless the adoption of a minimum height standard above the normal height of the general population for certain selected corps is economically unsound, as it may lead to physiological inefficiency.

The size of the individual as measured by his stature is of great importance when we are considering other physical characteristics, which when combined in the proper proportion give us a picture of the physically normal man. This question has been discussed fully in a paper I had the privilege of reading before the Royal Society of Medicine.[2] Briefly, I think we may state that the generally accepted opinion at the present time is that in the normal man all proportions of his body have a distinct relation to one another, and that the old method of using age as the factor for expressing the relationship was fundamentally wrong. On the other hand, if we use some physical factor—as, for instance, stature or trunk height—we shall find that in the normal individual an increase in stature is followed by a proportionate increase in weight, chest girth, etc., in fact all parts of his body. For instance, it is erroneous to infer that because two youths of, say, 18 years of age both weigh 124 lb., they are equally efficient as regards their weight. One youth may be 62 inches in height and above the normal weight for his height, and the other may have a stature of 72 inches and be much below the normal weight for his height.

By using stature as the factor we can show that in a normal individual every increase in height should be followed by a proportionate increase in every other physical characteristic.

Let us see what bearing the foregoing remarks have with regard to the fixing of the physical standard for the selection of recruits. I do not think we shall be far wrong if we assume that the average normal man from the male population may vary in stature from 65 to 70 inches. The average height of all recruits at the Central London Recruiting Dépôt during the past three years has been 66.2 inches.

If we could select all our recruits from youths having a stature between 65 and 70 inches, there is no doubt in my mind that increased physical and medical efficiency would be the result. There is no question that men of excellent physique do exist who have a greater stature than 70 inches, but the fact does not affect my contention that a greater percentage of "fits" will be found among those who approach the average of the general population.

Having fixed a standard of height for your recruit the next point is to estimate the fitness of the individual by a study of his physical proportions, and this is the point on which I am at variance with the regulations for recruiting for the army. The normal individual will show a definite relationship between his height and his other physical proportions, and I am convinced that if an individual is normal in this respect he is as physically perfect as any man can be, and suitable as regards his physique for enlistment into any branch or corps of the navy, army, or air force. This, however, is not the generally accepted opinion in the army. They would appear to be of opinion that a separate race or species of man exists specially suitable for each corps. A guardsman of the same age, weight, and height as an infantryman is expected to have a chest girth 1½ inches larger. A cavalry man of the same age and height as an infantryman is expected to be heavier and have a larger chest girth. An artificer in the Royal Artillery or driver in the R.A.S.C. (H.T.) is expected to be heavier and have a larger chest girth than the weight-carrying infantryman. At the present time there are ten different tables, showing the physical equivalents of the "tests" required for the different corps of the army. My contention is that such a multiplicity of tests is unnecessary and misleading, and shows an absence of scientific principles. To meet the supply and demand a minimum height standard for different corps may be desirable and even a necessity; but the selection of recruits as to their other physical characteristics should be according to one standard only, that of normality.

It may be asked, How is the question of physical normality affected by age? The answer is that during the actively growing period—that is, up to 21 years—the question of age need not be considered. The physically normal youth of 70 inches should weigh approximately 140 lb. and have a chest measurement at rest of some 33 inches no matter what is his age—17, 18, 19, or 20 years.

A table of physical equivalents (see p. 925) showing the normal relationship between the more important proportions of the body to the stature is essential to a scientific assessment of physical fitness. Such a table may be made applicable to youths varying in age from 3 to 21 years, and any marked deviation from the normal requires careful investigation before such an individual can be passed as fit.

The relationship between weight and height is, I think, the most important index of physical efficiency, more especially when it can be ascertained that any deficiency in weight is not due to underfeeding or actual starvation. A large percentage of individuals who show a deviation from the normal in regard to their weight will show other signs of defective physical development sufficient to brand them as "unfit," but a fair proportion may present no other

pothetical Table Based on over 5,000 Observations showing various Standards of Normalities for Males of the General Population under 21 years of age, calculated from the Stature in Inches.

ature.	Sitting Height.	Weight without Clothes.	Chest measurement at rest.	Food* requirements in Calories.	Approximate Age.
37 in.	21.74 in.	31.4 lb.	13.622 in.	1,156 C.	3 years.
38 "	22.112 "	32.91 "	20.015 "	1,225 "	
39 "	22.488 "	34.53 "	20.409 "	1,296 "	4 "
40 "	22.862 "	36.26 "	20.804 "	1,369 "	
41 "	23.24 "	38 10 "	21.1 "	1,444 "	5 "
42 "	23.62 "	40.05 "	21.498 "	1,521 "	
43 "	24.02 "	42.11 "	21.886 "	1,600 "	6 "
44 "	24.386 "	44.28 "	22.285 "	1 681 "	
45 "	24.772 "	46.55 "	22.685 "	1,764 "	7 "
46 "	25.16 "	48.95 "	23.086 "	1,849 "	
47 "	25.55 "	51.45 "	23.484 "	1,936 "	8 "
48 "	25.942 "	54.06 "	23.891 "	2,025 "	
49 "	26.336 "	56.78 "	24.295 "	2,116 "	9 "
50 "	26.732 "	59 61 "	24.7 "	2.209 "	
51 "	27.13 "	62.55 "	25.106 "	2.304 "	10 "
52 "	27.53 "	65. 0 "	25.513 "	2 401 "	
53 "	27.932 "	63 75 "	25.921 "	2,500 "	11 "
54 "	23.336 "	72.03 "	25.33 "	2,601 "	
55 "	28.742 "	75.41 "	26.72 "	2,704 "	12 "
56 "	29.15 "	78.9 "	27.131 "	2.809 "	
57 "	29 55 "	82.5 "	27 543 "	2,916 "	13 "
58 "	29.972 "	86.21 "	27.956 "	3,025 "	
59 "	30.3 6 "	90.03 "	28.37 "	3,136 "	14 "
60 "	30.802 "	93.96 "	28.785 "	3,249 "	
61 "	31.22 "	98.0 "	29.201 "	3,364 "	15 "
62 "	31.64 "	102.15 "	29,618 "	3,481 "	
63 "	32.062 "	106.41 "	30 035 "	3,600 "	16 "
64 "	32.486 "	1:0.78 "	30.455 "	3,721 "	
65 "	32.912 "	115.26 "	3 .875 "	3,844 "	17 "
66 "	33.34 "	119.85 "	31.296 "	3,969 "	
67 "	33.77 "	124.55 "	31.718 "	4,096 "	18 "
68 "	34.202 "	129.36 "	32.141 "	4,1:5 "	
69 "	31.636 "	134 28 "	32.·65 "	4,356 "	19 "
70 "	35.072 "	139.31 "	32.99 "	4,489 "	
71 "	35.51 "	144.45 "	33.416 "	4. 24 "	20 "
72 "	35.05 "	149.7 "	33.843 "	4,761 "	
73 "	36.492 "	155.06 "	31.271 "	4,900 "	21 "

*Formu'a for estimating the daily food requirements of the average youth expending an average amount of energy $(H-3)^4=C$ when "H" equals the stature in inches and "C" equals total food requirement in large calories.

obvious defect, and other causes must be sought to account for the weight deficiency. Incipient tuberculosis, heart disease, and defective teeth are among the more common disabilities associated with deficient weight.

With regard to the chest girth, in my opinion too great an importance has been paid to this measurement in the past. It is very difficult to obtain accurately corresponding measurements of the chest girth, even when we adopt the chest measurement at rest as the standard, but it is more difficult by far to obtain any accuracy of the degree of expansion, and when we have obtained this measurement it is of no value as an indication of vital capacity. The most that can be said of the measurement of the chest girth is that it is a useful index of physical development when considered in conjunction with other characteristics, and that a chest girth in excess of the normal may be associated with an asthmatic tendency. Chest girth below the normal and not associated with any other defect is of no great significance and is generally rectified by training. Deficient chest girth *plus* deficient weight is, however, a positive index of inefficiency, which is quite likely to remain in spite of training.

These few illustrations of the use of standards of physical normality in estimating physical efficiency will show, I think, that they possess some real value, not only to those of us who are interested in recruiting, but also to the medical profession in general; but much work needs to be done in the way of producing further standards by means of which we may construct an accurate picture of normal physique at any period between the ages of 3 and 21.

From a recruiting standpoint we must bear in mind that normal physique does not necessarily mean normal physical capacity; as a general rule they are closely associated, but, in addition to having normal physique, a soldier, sailor, or airman must be physiologically and mentally normal in order to be able to perform his duties with the highest degree of efficiency.

Physiological Normality.

It is not possible in the scope of this short paper to do anything but touch in the briefest manner possible upon questions of physiological normality. There would appear to be scope, however, for much useful research directed towards establishing more accurate standards of normality for certain physiological processes. For example, we are content as a rule to accept as the normal temperature of the body that indicated by placing a thermometer in the mouth. Such a method is far from accurate and does not record the changes of body temperature which are constantly occurring, due to alterations in metabolism, the result of food, exercise, fatigue, etc. Such changes can be shown only by taking the rectal temperature, when the normal resting and optimum working temperature for the individual may be ascertained. Some investigations carried out by the writer a few years ago would tend to show that temperament and internal temperature are closely associated. The healthy plodding and somewhat lethargic individual had a rectal temperature at rest some two or three degrees below the temperature of the somewhat neurotic individual. Whilst the rise of internal temperature, the result of exercise, in the one case was a matter of one or two degrees until an optimum was reached, in the other the rise was more sudden, reached a greater maximum, was liable to fluctuations, and took a longer period to return to the normal. It is possible that further investigation into the association of internal temperature and temperament may help in the elimination of individuals liable to break down from shell shock and the allied war neuroses.

It will be noticed in the table that the food requirements of the normal youth are shown in relation to his stature. These figures were prepared empirically on the hypothesis that the total energy output of the body is proportional to its length. It is, of course, recognized that such figures are of no value in estimating the actual food requirements of individuals for whom the rate of growth and activity are an unknown quantity, but they are of practical value in estimating the food requirements in schools and institutions where the daily ration is fixed according to schedule; in such cases the average height of the boys to be fed is the only factor necessary in determining the food value of the total ration sufficient to give each boy a diet commensurate with his physiological requirements. Recently Holt of America[3] has published a similar method of calculating the food requirements from the body weight, and his results are comparable with those given above.

Psychological Normality.

It has been mentioned above that the "frightfulness" of modern warfare, and the likelihood of this "frightfulness" increasing in the future, makes it imperative that those who are psychologically abnormal—in other words, those individuals liable to break down from functional nervous diseases—should be eliminated from our armed forces as recruits and not as trained fighting men. It has been stated that over 20 per cent. of all the soldiers discharged for disability from the British Army during the great war had one or another of the disorders grouped under the term "shell shock," "neurasthenia," or "war neurosis."

The evil, however, is not limited to the number of inefficients and to the waste of money in training men who break down from this cause. The danger of enlisting such cases is in their power to spread their inefficiency amongst others, resulting in hysterical mass movement, loss of moral, and possibly panic.

A large number of men who break down under the nervous strain of warfare do so from a fear of the unknown. Modern war methods, such as aeroplane bombing, gas, tanks, etc., are not conditions to which the average individual has become inured. A gas attack involving the same number of daily casualties as occurred in our last influenza epidemic would, without any doubt, have caused a panic amongst the civil population. It is in this connexion that the soldier's training is so useful. While at his training he should be familiarized with the weapons and noises of modern warfare, so that the unknown quantity of their frightfulness is eliminated.

There is nevertheless a large proportion of individuals in

whom a nervous instability is either inherent or the result of incipient disability, and it is with regard to these cases that every effort should be made to eliminate them from the fighting forces. The most suitable place for this to be done is at the training dépôt, where, by watching the behaviour characteristic of the recruits in conjunction with their physiological response to improved environment and training, and their ability to receive instruction, a very useful guide as to the recruits' psychology may be obtained, but at the same time much may be done at the recruiting dépôt to eliminate those who are mentally deficient or nervously unstable.

The mental tests devised by Binet provide a very useful basis for standardizing the degree of mental efficiency necessary for a recruit on enlistment, and also for classifying recruits according to their mental capacity; it is not possible, however, to adopt a classification of this nature in a voluntary army, but it is quite feasible to introduce a minimum standard of mental capacity below which no recruit will be enlisted. Such a mental test should aim at arriving at the normal mental capacity of the general population, which, in all probability, is not more than a 12- to 14-year mental age, according to the Binet-Simon method. A list of mental tests suitable for recruiting purposes is given in an appendix. These have been selected mostly from *The Measurement of Intelligence*, by Terman, and have proved to be of some help in actual practice at the Central London Recruiting Dépôt.

The objection to mental tests is that the results are of little value in inexperienced hands, and should be carried out, if possible, by psychological experts. Recruits who are liable to break down from war neurosis are frequently suffering from some incipient disease, also they may present signs of some physiological derangement, such as exaggerated reflexes, functional heart trouble, etc., which indicates the importance of the standards of physiological normality mentioned above.

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[2] Sylvester-Bradley: Stature in Relation to Physical Standards of Fitness. *Proc. Roy. Soc. Med.*, 1922, vol. xv, pp. 17-25.
[3] Emmett Holt: *Food, Health, and Growth.*
[4] Keith, Arthur: *The Human Body.*
[5] Terman: *The Measurement of Intelligence.*

APPENDIX.

MENTAL TESTS FOR RECRUITS.

Test No. 1.—Ball and Field Test.

Procedure: Let us suppose that your cricket ball has been lost in this round field. You have no idea what part of the field it is in. You don't know what direction it came from, how it got there, or with what force it came. All you know is that the

ball is lost somewhere in the field. Now take this pencil and mark out a path to show me how you would hunt for the ball so as to be sure not to miss it. Begin at the gate and show me what path you would take.

Nos. 1 to 5 are samples of "superior plans," satisfactory at 12 years.

(For a pass, recruit must equal 1 to 5.)

Test No. 2.

Repeat 5 digits backwards. (1 of 3. Read 1 per second.)

3-1-8-7-9..... 6-9-4-8-2..... 5-2-9-6-1.....

Procedure: Listen carefully. I am going to read some numbers to you, but I want you to say them backwards. For example, if I should say 1, 2, 3 you would say 3, 2, 1. Do you understand? Ready, now; listen carefully, and be sure to say the numbers backwards.

(Marking: One out of 3 passes.)

Test No. 3.—Clock Test.

Clock. (2 of 3. Error must not exceed 3 or 4 minutes.)

6.22 ..... Time required .....
8.10 ..... Time required .....
2.46 ..... Time required .....

Procedure: Suppose it is 6.22 o'clock—that is, 22 minutes after 6. Can you see in your mind where the large hand would be, and where the small hand would be?

Now suppose the two hands to change places, so that the large hand takes the place where the small hand was, and the small hand takes the place where the large hand was. What time would it be then?

Scoring: Two or three problems must be solved within following range of accuracy: 4.30-4.35, 1.40-1.45, 9.10-9.15.

Test No. 4.

Procedure: Listen carefully. I want you to imagine that you are with a companion, drifting in an open boat, at sea.

When you started your journey you had two buckets full of fresh water.

The first day you drank the water contained in one bucket.

The next day your companion set fire to his clothes while lighting a cigarette. What are you going to do?

(Fails if he throws the bucket of fresh water over his companion. Passes if he pushes him into the sea. Full marks if he fills empty bucket with sea water and uses that.)

Test No. 5.

If a lad's wage is 20s. a week and he spends 14s. a week, how long will it take him to save 300s.?

If 2 pencils cost 5 pence, how many pencils can you buy for 50 pence?

At 15 pence a yard, how much will 7 feet of cloth cost?

(Score: Should pass 2 out of 3, allowing a minute to each problem.)

Test No. 6.

Repeat 28 syllables. (1 of 2 absolutely correct.)

a. Walter likes very much to go on visits to his grandmother, because she always tells him many funny stories.

b. Yesterday I saw a pretty little dog in the street. It had curly brown hair, short legs, and a long tail.

Procedure: I am going to read a sentence to you. Listen carefully, as I want you to repeat it to me without a single change of any sort.

(Marking: Pass if one sentence is repeated without a single error.)

DISCUSSION.

Group Captain MARTIN FLACK stated that all precautions possible were taken to put candidates for the Royal Air Force at their ease and to distract their attention while the pulse rate was taken. The history of athletic prowess was important in a candidate.

Lieut.-Colonel N. J. CRAWFORD RUTHERFORD asked for information on the following points: (1) Could a standard by arrived at to eliminate the number of recruits discharged under six months' service as unfit owing to middle-ear disease? In spite of auroscopic examination of all recruits on enlistment discharges for middle-ear disease continued to head the list. (2) The advisability of simple mental tests on enlistment. He remarked on the usefulness of having a record of the recruit's mentality on enlistment to prevent subsequent discharges as "mental inefficients," as the recruit's mental attitude towards soldiering might alter.

Lieut.-Colonel W. SALISBURY-SHARPE agreed that marked deviations from the average of stature, either above or below, were disadvantageous to the individual. With reference to hearing tests, the only satisfactory watch was a stopwatch which could be started and stopped without audible click. The recognized standard instrument for ticking sounds was the acoumeter; this should be heard at a distance of fifteen feet in an ordinary room.

AEROPLANE ACCIDENTS.

BY

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[*Abstract.*]

THE points to be considered in classifying aeroplane accidents are, first, the causes; secondly, the type or in which part of the flight the cause was initiated; and, lastly, the actual damaging factor.

Causes of Aeroplane Accidents.

These may be considered under the following headings:

(1) Defect in the aeroplane.
(2) Error of judgement in flying.
(3) Loss of head.
(4) Brain fatigue.
(5) Fear.
(6) Physical illness.
(7) Unavoidable causes.

(1) This cause amounts to mechanical failure of some part of the aeroplane, and can be subdivided into (*a*) breakage in the air, and (*b*) engine failure. If the engine fails in the air a forced landing is compulsory, but given a fair height—2,000 feet or more—the pilot can usually select a good landing place. One of the commonest examples of aeroplane accidents is engine trouble just after leaving the ground, and in trying to turn back the pilot loses flying speed and the aeroplane falls to the ground.

(2) Error of judgement in flying is the commonest cause of aeroplane accidents, and of the many examples of this, perhaps the commonest is when on landing the pupil misjudges his distance from the ground and strikes the ground at a varying angle, usually overturning and wrecking the machine. It is difficult to estimate and account for these errors of judgement. In some cases the error may be due to insufficient instruction, and in other cases it may be found on examination that the pupil's standard of vision is below normal; but, on the other hand, the pupil may be physically fit, have normal vision and good balancing power, and in the latter cases it may be a case of delayed reaction times.

(3) Loss of head occurs fairly frequently and accounts for a considerable number of accidents. The pupil in his new occupation of flying is at high tension, and under the sudden strain of an emergency his power to reason and act synchronously may momentarily lapse, and there is seldom time to correct the error made.

(4) In contradistinction to loss of head the pupil in brain fatigue reaches the stage where he has neither the power to reason, decide, or act; a state of mental inertia supervenes. This is due to repeated stimuli received by his brain in rapid succession in his flight—he feels alone, and that he cannot manage to control the aeroplane; he feels helpless, and in a stupor awaits events and takes little part in the aeroplane's control. As a rule, if it occurs, the pupil, even if he should escape injury, soon gives up flying; he is not of a temperament suitable for flying.

(5) Fear, at least in a degree sufficient to disturb flying, is rarely experienced in the air on the first few solo flights, the mind being far too much occupied and concentrated on details of flying and watching the various instruments.

(6) At an air station medical inspection of the pilots and pupils at regular intervals reveals any organic disease that might lead to loss of consciousness in the air. Flying on an empty stomach may cause faintness, and as in schools flying commences at dawn all pupils are first provided with a good meal, while on long flights pilots are provided with tabloid forms of nourishment.

(7) From time to time unavoidable causes of accidents arise. The terrain in certain areas may be unsuitable and conceal obstacles, while in some aeroplanes the view of the ground in certain positions may be limited.

Type of Accidents.

The term "type of accidents" has been suggested to describe the part of the flight in which the cause of the accident was initiated. A flight may be divided arbitrarily into three parts: first, the getting off the ground into the air; second, in the air with the various turns, figures of eight, spirals, etc.; and third, the landing. The commonest type of accident is on landing.

Actual Damaging Forces in Aeroplane Accidents.

The injuries sustained are akin to most high velocity accidents, but are usually more severe, as greater speed is used in aviation. They include the following: (1) Injuries due to crushing, where some part of the pilot's body gets crushed between parts of the wrecked aeroplane or between the engine and the earth. (2) Injuries due to collision with the ground, as when the pilot is thrown out or hits the ground with his head in turning over in and with the aeroplane. (3) Injuries due to impact with different parts of the aeroplane, as when the head is violently jerked forward and strikes the edge of the nacelle on the aeroplane's impact with the ground. (4) Injuries from fire. (5) Drowning and immersion effects in seaplane work. (6) Suspension effects, as when the pilot is suspended head downwards in an overturned aeroplane and is unable to loosen his safety belt; in many crashes the sudden impact of the pilot's body on the safety belt causes abdominal injuries. (7) Poisoning from petrol fumes.

Safety Belts, Helmets, and Goggles.

With regard to the use of safety belts endless discussion has taken place among aviators. My own opinion is that before leaving the ground all aviators should see that their safety belts are fastened and should be familiar with the method of their quick release. The belts should never be undone in the air, but a difficult question arises whether to release the belt near the end of a glide before landing. Safety helmets are of undoubted value in school work and should be worn by all pupils. In a crash they certainly prevent scalp wounds and the side flaps protect the ears from injury. Most aviators wear goggles, but there are still some who prefer to fly without them. I certainly think that goggles should always be worn; there is no doubt that flying without goggles is apt to set up a spasm in the eyes.

First Aid at an Air Station.

The sick bay or dressing station should be in full view of the aeroplane, with a look-out man supplied with field glasses always on duty during flying hours. Immediately a crash or forced landing occurs the look-out man telephones to the sick bay, notifying the steward of the exact site of the occurrence, and proceeds with a stretcher to the accident. With the stretcher is taken an emergency tool-case, which includes crowbars, wire cutters, saw, fire extinguisher, etc. The steward dispatches the ambulance with which two sick-berth attendants go, and with them is a bag containing morphine, hypodermic syringes, chloroform, brandy, first-aid and picric acid dressings, etc. If the injured person is conscious and in much pain morphine should be injected and the patient conveyed quickly to the dressing station, where his injuries should be examined and treated; chloroform may have to be given, as it acts more quickly than morphine.

The Nature of the Injuries Received.

Surgical work in connexion with aviation in general differs but little from that in military and civil life. The difference is mainly one of degree, in that one is mostly called upon to deal with the results of high velocity accidents associated with falls at varying angles and from various heights. Burns are among the most severe forms of injury. The cold at high altitude is extreme, and aided by the rapid transit through the air is apt to cause frost-bite easily. In a large proportion of aeroplane accidents the occupants receive injuries to the face, owing to the impact throwing their heads forward. Fractures of both bones of the leg and fractures involving the ankle-joint are very common.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

ACUTE INTESTINAL OBSTRUCTION DUE TO AN UNUSUAL FOREIGN BODY.

I WAS called in to see a man, married, aged 48, who was suffering from obstruction of the small bowel of some days' duration. He was vomiting large quantities of foul-smelling brown fluid and was collapsed. On admission to hospital he told me that four days previously he had swallowed, for the purposes of a bet, a rubber preventive (condom) two-thirds filled with fluid and tied at the free end.

I operated immediately and found this object completely obstructing the small bowel about eight inches from the ileo-caecal valve. I removed the obstruction; there was a considerable amount of free fluid in the abdomen and the bowel above the obstruction was very distended and congested.

S. B. CHAMBERS,
Honorary Assistant Surgeon, Royal South Hants and Southampton Hospital.

MELAENA NEONATORUM: RECOVERY.

MANY fatal cases of melaena neonatorum have been reported in the medical journals, but up to date very few of successful treatment. The subject of this note was the first-born child of strong, healthy parents. The mother had been operated on by Mr. Comyns Berkeley on February 1st, 1922, for uterine myomata. Labour at full time commenced on Friday, September 21st, 1923, and terminated on Tuesday, September 25th. No liquor amnii was seen.

The child, a male, which weighed just under 5 lb., was very thin and the skin very dry and shrunken. At 9 a.m. on September 26th he began to vomit blood and passed a motion containing much blood. At 10 a.m. I injected subcutaneously 2 c.cm. of haemoplastin (Parke, Davis and Co.). Melaena recurred in the afternoon, so at 6 p.m. I repeated the dose and bleeding did not recur. On October 31st I circumcised the child, which weighed 7 lb. 5 oz., and injected 2 c.cm. of haemoplastin as a precautionary measure. There was no abnormal haemorrhage. The mother had no rise of temperature after labour and made a rapid and normal recovery, but was not able to nurse the child.

Bedford. W. GIFFORD NASH, F.R.C.S.

TREATMENT OF TETANUS.

THE following case of tetanus may be of interest in view of Mr. J. A. Hayward's letter in the BRITISH MEDICAL JOURNAL of September 8th (p. 439).

On the afternoon of July 25th G. H., aged 7, was playing in a street gutter when he caught his foot in a grating, receiving a deep wound on the under surface of the right great toe. He remained at home a week, being attended by his own doctor, who employed eusol and hydrogen peroxide.

On the seventh day his parents noticed that he suddenly became fretful and was unable to open his mouth properly. The condition appeared to improve during the day, but next morning (August 2nd) there was definite rigidity of the muscles of mastication; 1,000 units of tetanus antitoxin were then administered and the patient was sent to the Edinburgh Royal Infirmary.

On admission it was noted that he lay with head slightly retracted, that the masseter muscles were contracted, the teeth tightly clenched, the expression anxious, and the forehead beaded with perspiration. Temperature 97°, pulse 128. The right great toe was black and gangrenous in its distal half. There was a deep wound running across its under surface almost severing it. Under chloroform anaesthesia the foot was cleansed with spirit and iodine. During this procedure the distal half of the right great toe dropped off. Amputation was therefore performed at the metatarso-phalangeal joint, a slip of dental rubber introduced, and the flaps partially approximated. Antitetanus serum was then administered—10,000 units (concentrated) intrathecally, 3,000 units intravenously, 9,000 units intramuscularly, and 1,500 locally about the base of the toe—a total of 23,500 units.

The next day there was marked opisthotonos; spasms of limbs and facial muscles at frequent intervals throughout the day. He was unable to swallow anything. Rectal feeding was carried out and chloretone, gr. x in olive oil, administered per rectum morning and evening. Under chloroform anaesthesia 10,000 units were injected intrathecally and 6,000 units intramuscularly.

On August 4th the spasms were limited to the face; opisthotonos still marked; temperature 102°, pulse 136. He was very fretful and woke frequently with piercing shrieks.

On August 5th the spasms were still limited to the face; opisthotonos less marked; temperature 100°, pulse 120. He was able to open his mouth about half an inch, and take liquid nourishment. Bowels moved only after an enema. Under chloroform 6,000 units of antitoxin were injected intramuscularly.

The following day, after a fairly good night's rest, the temperature was settling. Under chloroform 1,500 units were injected intrathecally and 7,500 units intramuscularly.

The pectoral region had been selected for the intramuscular injections, but an urticarial rash appeared over the front of the chest on August 6th. This was overcome by varying the site of injection to the thighs and buttocks, a few days' rest being sufficient to allow the rash to clear. Daily intramuscular injections were continued till August 16th, the dosage being reduced from 6,000 to 4,500, and finally to 3,000 units. Anaesthesia was employed on each occasion till the dosage had decreased to 3,000.

Opportunity was taken under the relaxation of the anaesthetic to clean the mouth and tongue, which had become thickly coated. The patient took plenty of liquid nourishment, but it was over a fortnight before he could swallow solids. Constipation was a marked feature throughout, and mild aperients were given regularly. The temperature and pulse settled by the tenth day. He was left exceedingly weak and could not sit upright in his cot for three weeks. The characteristic risus sardonicus persisted till about six weeks after admission.

He was allowed up on the twenty-sixth day, but was very unsteady on his legs. He improved rapidly thereafter, and was discharged on September 25th, strong and well—expression practically normal and toe healed.

In this case 89,000 units of antitoxin were administered over the course of fourteen days (39,500 in the first forty-eight hours)—21,500 intrathecally, 3,000 intravenously, 64,500 intramuscularly and locally. Apart from the chloretone on the second day and the numerous anaesthetics, no other drug treatment was employed.

Prophylactic doses of antitoxin have been used as a routine in this clinic since the war, and this case is only the third seen in 9,500 surgical cases. Only one of the three developed in the hospital—a gunshot wound in 1913.

I am indebted to Mr. J. W. Dowden, surgeon to the Royal Infirmary, Edinburgh, for permission to report the case.

Edinburgh. HAROLD K. CORKILL.

Reports of Societies.

CONSTIPATION FROM THE GENERAL PRACTITIONER'S POINT OF VIEW.

A DISCUSSION on constipation, its causes, results, and treatment, from the general practitioner's point of view, took place at the meeting of the Medical Society of London on November 12th, with the President, DR. HERBERT SPENCER, in the chair.

Dr. H. DES VOEUX, in opening, said that the profession should lay it down as a canon of sound and healthful existence that the bowels could and would act daily and naturally, without medicament or extraneous help. There was too much of the attitude of the physician who said, "Well, thank God, we have the bowels to treat." When the speaker was young it was thought that a daily evacuation was essential, and the unnatural corollary was that purgatives and laxatives were freely and thoughtlessly administered. This doctrine, slightly modified, still remained certainly with regard to the nursery, where tender infants were constantly dosed for any slight ailment. In practice about half the doctor's work was connected with the stomach and bowels. Individual members of the profession had little power to prevent the occurrence of diseases of the heart or lungs, but in those of the stomach and the bowels they had ample means of prevention. The rectum and bladder, which he might describe as the ground floor back and front of the body, had much the same functions to perform, but the former was subject to the conscious interference of the mind, while the latter was governed almost unconsciously. The reflex action of the bladder could only be restrained for a short time, whereas the rectum could be controlled to suit convenience, with the result that the number of cases of bladder trouble dealt with was infinitesimal compared with those of trouble of the bowel. A healthy bowel meant a healthy body. The druggist's shop provided a sop to Cerberus, which, once thrown, must be repeated at intervals. Constipation began early in life, but not until the age of three or four did the full development of symptoms usually attract attention. The simplest definition of constipation was the retention in any part of the bowel of the unused or unusable food

that had been ingested. It was absurd to be satisfied with the answer of the patient that there was a daily motion. In the majority of cases the amount passed was probably not the totality of the contents of the big bowel; there was a residuum. In the normal bowel the sensation of faeces in the rectum was uncomfortable and led to evacuation; the civilized bowel had been educated to neglect this feeling. If the patient could not diagnose his own constipation it became the doctor's duty to neglect the patient's opinion and decide for himself. Until the diagnosis of constipation was taught, the disease would continue unabated. For some years, with a certain amount of success, he had been trying to diagnose the condition without *x*-ray examination. If faecal elements were felt in the rectum or colon the patient was constipated; this diagnosis was possible and not difficult provided the abdominal wall could be relaxed. He thought that a further step might be taken; if the colon in part or whole was constantly distended the diagnosis of constipation was justified. Beyond these two signs he had not discovered any of use, apart from the series described by Sir W. Arbuthnot Lane. The speaker went on to point out the evils of overfeeding in children, especially deprecating such expressions as "nourishing food," "digestible food," and "feeding up." All food ought to contain a considerable proportion of indigestible substances, for this part of the ingesta passed through from one end to the other and acted as a gentle stimulus. The contents of the colon ought to be indigestible and bulky. Yet as much as possible of the things which were considered indigestible, such as skins of fruit and vegetables, like apples and potatoes, stalks of such vegetables as cabbage, and the skins of animals, were rigidly and purposely excluded from the diet of young children; in his view they ought to be included. The time had come for a complete revision of the dietary to be recommended. The contest they had to wage might be described as in favour of apples against milk; milk had been placed in the position of a goddess to be worshipped; it was time she was dethroned. With proper attention to children, the incidence of constipation and its consequences would tend to diminish, but this result could come about only with the growing up of the new generation, and the doctor was left to face the problem in the adult population. He had two alternatives—diet and medical treatment by enemas or drugs assisted by massage and physical exercises. The best method was by diet. His own belief was that people could eat as much as they wished, provided that the food passed through quickly enough, and that all the residuum was cleared daily. It was a mystery how much the Englishman would spend on the main drain of his house while he paid no attention at all to his own main drain, which was the commencement of the house drain, though unfortunately disconnected! The body should be exercised daily. All systems of exercise had the drawback of taking up too much time, and the great majority of those who began them gave them up after a few weeks or months. He advised a few exercises which had been modified from those taught him at school by the old drill sergeant, and of these he showed the Society a cinematograph representation. They consisted in swinging the arms at first backwards and forwards and presently right over the head, then rapid leg movements up and down, followed by bending the body backwards and forwards, and finally rapidly alternating the body between an upright and a squatting posture. Each of these movements should be repeated twelve times, and the whole series should not occupy more than three minutes. They were suitable for young and old, they worked every joint in the body, they called for frequent and deep respiration, and the heart had to put out its best to carry them through.

Dr. WALTER BROADBENT considered that the most important cause of constipation was repeated neglect of the stimulus to defaecate, particularly after the morning meal. The upper rectum and sigmoid as a consequence of that neglect became atonic. The condition often originated in infancy through the carelessness of mothers and nurses. Artificial foods, especially dried milks, encouraged constipation. The addition of a little cream to each bottle would help matters, or liquid magnesia or petroleum, or syrup of figs might be needed. Babies should be encouraged to have an action every day soon after a feed. Small children should also be set down at stool soon after breakfast every morning, and not be allowed to go out to duty or play before this was accomplished. Up to a few years ago there was a great difference in the incidence of constipation as between the sexes, it was rare in males, and very common in young women. Now there was a marked improvement in young women, due, he thought, to the more hygienic corset, to better sanitary arrangements in girls' schools, and to the increased athleticism of girls. In old people there was a kind of constipation characterized by diarrhoea, a small amount of faeces being evacuated frequently. The cause was a large and solid mass of impacted faeces which often could not be evacuated without special measures. The first thing to consider in the treatment of constipation was diet. The early morning cup of tea was a helpful institution; porridge at breakfast, especially when made with coarse ground oatmeal, was also helpful, and so was the glass of hot water last thing at night. It was imperative that there should be a regular time every day for the movement of the bowels. It must be soon after a meal, and should be after breakfast. Only if all such methods failed must resort be had to drugs.

Dr. D. M. BARCROFT said that in approaching the subject of constipation it was important to be quite clear whether they were dealing with a disease or merely with a symptom. To his mind there was no such disease as constipation, and researches could not go very far before it was realized that constipation was a symptom only. From the diagnostic point of view the symptom constipation was not of any value. If one looked through a System of Medicine constipation would be found to figure as one of the symptoms in the picture of the great majority of diseases described. So much was this the case that occasionally one found such a condition as typhoid fever ushered in by constipation rather than diarrhoea. It was the general experience that a patient who was confined to bed and was forced to use a bed-pan, necessitating a horizontal position, was unable satisfactorily to evacuate the bowels. If posture was a factor in successful defaecation might not it be a factor also in preventing minor degrees of constipation? The most satisfactory posture was with the thighs acutely flexed, which gave a measure of protection against rupture, and at the same time enabled the voluntary muscles which took part in the act to function to the best advantage. Defaecation called for a combination of the voluntary and involuntary mechanism. It was always the terminal event in a series of involuntary muscular efforts. In initiating the process of digestion it was found that from earliest infancy the taking of meals must be at regular intervals. In no other way could satisfactory digestion reasonably be expected. A similar regularity was called for in the case of defaecation. There were some individuals who normally had two evacuations a day, others normally would go for two or three days with only one evacuation, but the vast majority of mankind got on best with one evacuation a day. In the natural state the call to stool could be promptly answered, but in the civilized condition it was often impossible to answer the call immediately. The wise course was for the patient not to become dependent on the call for evacuation, but to establish a habit whereby the evacuation took place at about the same time each day. In this way a better combination of all the forces at work would be arrived at than by the more haphazard method. It was surprising how the habit of regular defaecation became established, and how such a change of circumstances as from summer time to winter time or the reverse would disturb the action, so that the bowel required several days to adjust itself to the altered hour. Some measures taken to correct constipation by forcing muscular contractions were likely to make the condition more pronounced.

Dr. W. W. STOCKER agreed that constipation was a symptom and not a disease. It was caused by prolonged retention of faeces in the intestines and rectum. Sometimes faecal colic occurred, when large masses accumulated in the colon, and death might even be caused by intestinal obstruction. Faecal tumours had to be very carefully distinguished from malignant growths. Constipation, when not due to mechanical obstruction, resulted from the

impairment of the peristaltic action of the intestine, weakness of the rectal nerves, or excessive obesity. Sedentary habits also contributed. The speaker criticized the modern lavatory, which made a squatting position impossible. It might be that the construction of the lavatory was one of the great causes of constipation in modern life. A simple adjustable lavatory seat should be in every house where there were children. In how many houses were the lavatory seats suitable for children of school age? Where the case was very chronic a normal saline draught—one quart—taken at seven o'clock in the morning would act within half an hour. The lubrication of the bowel and contents was often necessary, as the faeces were dry and hard.

Dr. EDWARD FURBER said that constipation began in infancy. The nurse and mother were probably constipated themselves, and therefore they did not realize how important it was to educate the child. The child was too frequently scolded over the matter, and all its associations were thereby made unpleasant to him; it might even figure in his nightmares. Among the causes of constipation was a painful condition of the anus which was frequent in infancy after hard constipated action. In adults constipation due to drugs taken from vicious habit should not be overlooked. The speaker exhibited an American apparatus designed for a colon douche.

Dr. PERCY SPURGIN quarrelled with the ordinary conception of what was known as constipation, which was defined as a packing together of the contents of the bowel. Constipation appeared to him to be an inability to evacuate a quantity of faecal débris corresponding to the solid food taken. Apart from surgical or pathological conditions, constipation was to his mind entirely a habit, and due to various causes. It was not in any sense of the word a disease, but, like many habits, if neglected it might become a disease. The cause must be separately considered in the case of children, adolescents, and adults. In children, he agreed with previous speakers, it was due almost entirely to the fault of the mother or the nurse, their want of perseverance and firmness. The child was encouraged in the bad habit of putting off the natural function. On the other hand, there were many children who appeared, curiously enough, to be wilfully obstinate, and who would not evacuate even when held up. There, again, the mother did not persevere. From this failure a whole series of troubles took their rise, leading to serious results in later life. Afterwards came the misuse of aperients as a contributing cause. Proper dieting was the natural and reasonable treatment of constipation, and aperients were grossly misused, especially by those people who thought that every advertisement they saw in the newspapers was going to be a panacea. Unsuitable dietary and faulty exercises were factors which accounted for much constipation among children. Some people thought that by violently exercising the child they were going to induce its muscles to work, whereas what they were doing was merely fatiguing the musculature. In the very small child irregularity of the hour of defaecation was almost the natural thing. In the older child this irregularity should be discouraged in favour of regular habits. In adolescents want of supervision was an important cause of constipation. There was too much hurrying to school. Among grown-up people there was a widespread failure to realize the necessity for regular habits, not only in eating, drinking, and sleeping, but in evacuating the contents of the bowel. He maintained that it was the irregularity of the hour at which the grown-up person went to stool which had a very marked effect on occurrence of constipation. For the headache which nearly always arose from these troubles there was a growing tendency nowadays for the general public to treat themselves with aspirin, and against the misuse of aspirin in this connexion he felt it very necessary to make a protest. If people would take the old-fashioned "blue pill" instead of aspirin their headaches would get better far sooner. Liquid petroleum was very useful for the child, and so, with certain reservations, was syrup of figs. One thing which he had used very much was phenolphthalein, which in reasonable doses was an excellent drug. Mr. Squeers, who dosed his boys on brimstone and treacle, based his treatment on common-sense lines, for the boys were being fed not on the most ideal diet, and Mr. Squeers rightly considered that to get rid of undue waste it was well to give something partially palatable and a reasonable laxative. To encourage a proper muscular action of the intestine it was necessary to tone up, either by massage externally or medicines internally. He had found that a mixture of nux vomica and soda, or occasionally magnesium carbonate, and always a little belladonna, had a marvellous effect. The belladonna relieved the spasm which frequently occurred in constipation, and which was itself a further cause. Cases of very bad constipation should be dealt with by enemas..

Dr. MORELAND MCCREA was inclined to make a finer division of age periods, from the point of view of causes of constipation, than had been made by preceding speakers. In the first decade of life (apart from the year of infancy) during which constipation occurred about equally in both sexes, the chief cause was laziness and lack of habit formation. Defaecation was associated in the child mind with threats, which was a pity. In the second decade constipation was much more common in the female than in the male, and the causes were principally the greater shyness of the female and the fact that there were still not enough sanitary conveniences in girls' schools. In the third decade he thought the condition still more common in the female, and here again shyness played a part, also want of habit, and at this period one began to see the constipation which was caused by pelvic disorders. In the fourth decade there were still more females than males among the sufferers, though the incidence was increasing among males; among females the commonest cause now was the loss of muscle power after confinements. In the next decade cases among males occurred with fair frequency, the cause being loss of tone. By the sixth decade the sexes were about equal. Here, in the case of women, constipation was apt to be caused by the hypothyroidism of the menopause. As to treatment he was strongly in agreement with those speakers who looked with abhorrence on aperients. He thought also that too much reliance was placed upon foods for children so made as to leave no residues. Exercise from the second decade onwards did a great deal of good. A very mild saline every morning was extremely beneficial, and he also praised the merits of cascara.

The PRESIDENT, in closing the discussion, referred to the need for more attention to lavatory construction, especially from the point of view of children. Dr. DES VOEUX, in replying, criticized the contention of some speakers that constipation was a symptom only, and not a disease. It was curious that a mere symptom should cause all the diseases which had been mentioned. He believed it might truly be described as a disease, or if not a disease it certainly acted like one.

PYKNOLEPSY.

AT a meeting of the Section of Neurology of the Royal Society of Medicine held on November 8th, Dr. W. J. Adie read a paper on pyknolepsy, a form of epilepsy in children with a good prognosis. He first described a case of his own in which all the features seemed to point to a diagnosis of epilepsy, but which showed certain peculiarities—the great frequency of the attacks from the beginning, their sameness, their uniform mildness, and their obvious harmlessness. Prolonged treatment with bromides, luminal, and other remedies had produced no effect on the attacks. He had asked himself whether this case could be one of so-called pyknolepsy. The attacks had ceased soon after and had not recurred. Such an experience had stimulated him to search the literature and he had found that nothing had been written on the subject in England. Friedmann had first described the disease in 1906 in a paper entitled "On non-epileptic absences or short narcoleptic attacks." He was followed in 1907 by Heilbronner, and in 1921 Friedmann returned to the subject, giving a very favourable account of the after-histories of his original cases. Since then numerous papers had been written on the subject, chiefly in Germany. Friedmann states that the disease has only one symptom—the attacks. These begin suddenly in healthy children between the ages of 4 and 10 years and recur with

great frequency, up to a hundred daily, in spite of careful treatment. After persisting for different periods from a few weeks to many years they seem to disappear entirely. Neither the physical nor mental development of the patients is affected. A uniform mildness characterizes the attacks, which consist in an inhibition of the higher psychical processes lasting from five to ten seconds. Speech and voluntary movements cease, but automatic movements remain. There are never any convulsive movements and consciousness is not completely lost.

Dr. Adie said that the contrast between the prognosis in these cases and cases of ordinary epilepsy in children was remarkable, according to prevalent ideas. He had been able to find cases recorded in the literature where freedom from attacks for as long as ten years had occurred. Could such cases be described as ordinary epilepsy? The spontaneous recovery which appeared to be the rule in pyknolepsy was most unlike ordinary epilepsy. In epilepsy the prognosis was especially bad in cases with repeated minor attacks and where no response to treatment obtained. And yet this was exactly what took place in these cases where the prognosis was so invariably favourable. In pyknolepsy the acme of the disease was attained at once and its most characteristic feature was the monotony and the uniform mildness of the attacks that might recur daily for many years, without the occurrence of any change in the type of attack. Mental deterioration and psychical defects, so common in epilepsy, did not occur in this other form of disease. Such great differences in the two conditions were not to be ignored. The name "pyknolepsy" suggested by Schröder was suitable as it emphasized the closely packed or aggregate attacks which were typical of the condition.

He proceeded to give some further details showing that the onset of the disease was between 4 and 10 years; its duration had varied from seven weeks to ten years, with a mean of nine years. The actual onset was sudden, almost explosive in some cases, the frequency of the attacks very constant for each case. An equally sudden termination was the rule. The most important single feature of the attacks was their extraordinary monotony. The absence of any result from treatment was so typical of the disease that a favourable response to treatment was not consistent with a good prognosis. There did not appear to be any association with a family history of epilepsy, alcoholism, or nervous disease. Such symptoms as clonic movements, however slight, vasomotor disturbances, mental distress, palpitations, lassitude, or confusion after the attacks were quite foreign to the condition and were, on the other hand, more suggestive of true epilepsy. At the onset there was nothing in the attacks to distinguish them absolutely from epilepsy, and a certain amount of observation was required before a final opinion could be given. Actual falls and involuntary micturition was to be regarded with great suspicion. Until we had greater experience it was better to restrict the term "pyknolepsy" to cases that conformed absolutely to type. Abroad the condition had been accepted as being a disease *sui generis*. He himself would be content if he had succeeded in conveying the lesson that there did exist a form of epilepsy which was associated with a good prognosis.

DIURNAL INCONTINENCE OF URINE IN WOMEN.

A MEETING of the Brighton and Sussex Medico-Chirurgical Society was held on November 1st, with Dr. ELIOT CURWEN, the President, in the chair, when Mr. H. F. SEYMOUR read a paper on diurnal incontinence in women.

Mr. Seymour said that this form of functional incontinence of urine was very common in women over 40 years of age, especially those who had borne children. It occurred only when some effort was made which produced sudden abdominal strain, such as coughing or sneezing, or some movement which involved a sudden jerk. Women were inclined to bear this uncomfortable symptom philosophically, as one of the after-effects of childbirth, thinking nothing could be done to relieve them. The symptoms being so common, it was surprising that British gynaecologists had paid so little attention to it. Mr. Victor Bonney had lately ventilated the subject in a very able paper, from which Mr. Seymour quoted, and a series of diagrams were shown giving the anatomical relations of the parts involved. It was pointed out that the causative factor was the relaxation of that layer of unstriped muscle fibres known as the pubo-cervical muscle-sheet, which normally supported the female bladder, and that it was the anterior third of that sheet which sagged in its relaxed state and so allowed the momentary displacement of the urethra, causing the incontinence. The incontinence was more likely to occur when the bladder contained very little urine. The vesical sphincter in women was very weak and easily dilatable, and after having been dilated to a great extent incontinence did not result.

Regarding treatment, Mr. Seymour stated that palliative measures were of no use as there was no kind of pessary which would be found to help. He gave a description of an operation for reinforcing the unstriped muscle fibres beneath the urethra by means of buried sutures of an unabsorbable material, inserted transversely after exposing the urethra by means of a vertical incision through the anterior vaginal mucous membrane. The operation was reported to be successful in the great majority of cases and recommended for all patients above 45 years of age who were distressed by this symptom, where there was no contraindication. It was sometimes necessary to combine with this simple operation an anterior colpoplasty if a cystocele were present at the same time.

Mr. Seymour then went on to consider another subject, the treatment of retroversion of the uterus, under three headings: (1) no treatment at all; (2) palliative measures; and (3) surgical means. (1) When a retroverted uterus caused no symptoms there was no need to treat it. (2) Regarding palliative measures, pessaries were of considerable value in the treatment of retro-displacements of the uterus, but they had only a limited field of usefulness. Pessaries should never be used for a long time in patients with a tendency to pelvic neuroses as they were often made worse by their use. Pessaries were most useful in the retroversion of early pregnancy, holding the uterus as they did in a normal position, and preventing an early abortion or incarceration of the gravid uterus. Again, pessary treatment was often called for during the puerperium when the uterus was retroverted on account of subinvolution. (3) The various operations which had been designed for the relief of retroversion were discussed and described in detail. Mr. Seymour advocated the intraperitoneal round ligament shortening operation, which was a modification of Gilliam's method. This operation done through a Pfannensteil incision was, he believed, wellnigh faultless, and gave the best results. Moreover, it was a particularly suitable procedure during the years of potential childbearing and in no way interfered with normal labour.

ABERDEEN MEDICO-CHIRURGICAL SOCIETY.

A CLINICAL meeting of the Aberdeen Medico-Chirurgical Society was held on November 1st, with the President, Dr. ALEXANDER OGSTON, in the chair, when Dr. W. F. CROLL showed a child aged 8 years with her heart on the right side; the electro-cardiogram showed that the case was not one of dextrocardia, but the lung condition did not appear sufficient to explain the irregularity. He also showed a case of aortic stenosis with delayed conductivity and endocarditis lenta. Dr. ANNE MERCER WATSON and Dr. A. G. ANDERSON demonstrated two cases showing the late sequelae of encephalitis lethargica which presented the syndrome of a mid-brain lesion. Dr. H. J. A. LONGMORE showed a case of acroparaesthesia.

A man of 63 complained of pain, swelling, and stiffness of the hands and lower half of both forearms while at rest; there was no alteration in sensation, and the general physical examination was negative except for a persistently high blood pressure; the condition was relieved by active muscular movement. Treatment by vaso-dilators and other means, including high frequency, had been without result. Dr. Longmore pointed out that the case was apparently the converse of intermittent claudication, and suggested as the diagnosis acroparaesthesia associated with vascular degeneration.

Professor ASHLEY MACKINTOSH read a note on a case of Brown-Séquard's paralysis of traumatic origin, and showed radiograms confirming the diagnosis of a lesion at the level of the fifth cervical vertebra. A short discussion of the cases followed.

Reviews.

DISEASES OF THE BREAST.

DISEASES of the breast have attracted a host of writers and investigators, and judging from the number of recent publications the popularity of the subject is certainly not on the wane. Mr. WILLMOTT EVANS in his recent book entitled *Diseases of the Breast*[1] has endeavoured to describe the present state of knowledge, and has not hesitated to express his own views on many of the problems which remain unsolved. Although no new or startling facts are revealed, he has drawn widely from the literature, and discussed the subject with considerable adroitness. A pleasing feature of his book is the number of illustrations. In all there are 106, of which fifteen are coloured. Mr. S. A. Sewell is firmly establishing his reputation in the art of illustrating anatomical specimens. Not only is the anatomical structure of his drawings true in detail, but the setting is artistic, and the stereoscopic effect well accentuated. The early chapters deal with the anatomy and physiology, examination, and anomalies of the breast. The nipple is discussed in four chapters, then follow the various inflammations of the breast, cysts, and tumours; diagnosis, prognosis, and operations for carcinoma of the breast are then discussed. The concluding chapters deal with skin grafting, the history of operations for mammary carcinoma, the treatment of inoperable cancer, and the diseases of the male breast. In the chapter on anomalies of development there are some interesting remarks and quotations on mammary deficiencies and redundancies. Attention is drawn to the anomalies of the sterno-mastoid, and sometimes of the ribs in the condition of amazia. Paget's disease is discussed under two heads—the eczema type and the psoriasis type. As to the etiology Mr. Evans quotes Sampson Handley, who considers that carcinoma starts in the smaller ducts and that the eczema is secondarily caused by lymphatic obstruction.

All the various views on the causation of chronic mastitis are considered. The one favoured by the author is that it is due to chronic toxaemia, and his dictum on the treatment is that when in doubt it is better to remove the breast than wait for carcinoma to develop.

On the subject of metastases in bone from carcinoma of the breast the author expresses agreement in the main with Sampson Handley's permeation theory, although he is inclined to think that embolism is responsible for some of them. It is surprising that the recent work of Piney has not been included; it supports the view that the blood stream is responsible for the dissemination of bone metastases. He has pointed out that these secondary tumours arise in the red marrow at the proximal ends of the long bones. Here the blood stream widens out and is slowed, factors favourable to the lodgement and growth of malignant cells in circulation. Moreover, he can find no evidence of lymphatics in bone to sustain Sampson Handley's theory. Mr. Evans draws attention to the fact that the ordinary carcinoma cell is larger than a pulmonary capillary, and that *a priori* secondary carcinoma in the lung should be common, which is not the case. Later we are asked to accept the permeation of cancer cells along lymphatics and their transcoelomic migration. Why, then, cannot we assume that these cells permeate through the capillaries in the same way, and in circumstances—the alternate expansion and collapse of the lung—far more favourable to their propulsion?

The author quotes what seems to be a convenient method of distinguishing quickly morbid growth from healthy tissues. It consists in immersing the part removed for ten minutes in 5 per cent. nitric acid. The tumour and gland substance then appear as a white opaque mass, while the surrounding fibrous tissue and fat become swollen, homogenous, and clear. The etiology of carcinoma is well discussed, and the author expresses the opinion that only the parasitic theory of the origin of malignant disease can offer an adequate explanation of all the phenomena to which a malignant growth can give rise.

This book forms a valuable contribution to the literature on this subject, it is well up to date, and at the same time gives all the practical detail so indispensable so far as the diagnosis and treatment are concerned.

HEART DISEASE AND ITS TREATMENT.

So much has been written on diseases of the heart in recent years that one is tempted to doubt the necessity for any new publication unless to communicate some fresh discovery. Dr. W. D. REID of Boston considers that the very greatness of the advance in recent years necessitates the redrafting of our knowledge of the subject so that the newer facts may be correlated with older methods that have stood the test of time, and this he has attempted to do in his book on *The Heart in Modern Practice*.[2] He also thinks that the time has come to depart from the common plan of dealing with diseases of the heart from the structural standpoint and that an attempt should be made to discuss them from the etiologic aspect, so that several chapters need not be read to find out the effect, say, of syphilis on the circulation, even though the plan at times leads to some overlapping.

The book is divided into five sections. The first deals with preliminary considerations; it treats of the anatomy, physiology, and methods of examination, physical and graphic, and closes with a chapter on the classification of heart disease. Illustrative tracings from the polygraph and electro-cardiograph are given, but the polygrams are not always sufficiently clear to make them really useful for diagnosis to those who have not already a knowledge of these methods. In his classification the author deals first with types of disease according to their etiology, then with functional conditions, and lastly with structural lesions. In the succeeding sections these three groups are treated more in detail. The allocation of chapters to rheumatic heart disease, cardio-vascular syphilis, arterio-sclerotic heart disease, irritable heart, and other conditions, constitutes the best feature of the book, though the reader will look for a little more detail in parts. In the section on functional conditions it would have been better to have the illustrations alongside the text, where they would be particularly useful. The fact that most are given in the first section hardly meets the convenience of the reader.

The last section deals with treatment in general, although this subject has been taken up in other parts of the book. In discussing digitalis therapy the Eggleston method is described in detail as being the standard in America. There is an appendix of about 65 pages devoted to illustrative cases, but many of these could have been curtailed without diminishing their value. There are many good points in the book, and the few plates illustrating structural conditions are well produced. We hardly think, however, that it is destined to become popular in this country.

A CONDENSED ENCYCLOPAEDIA.

Lippincott's Quick Reference Book for Medicine and Surgery[3] by Dr. REHBERGER is frankly a compilation. The author claims nothing as his own in the work except the plan, the selective judgement employed, and the great labour involved. Its matter is culled from modern medical teaching and coloured by the varied experience of one who has been an isolated country doctor, and feels that he knows the needs of the general practitioner. He has aimed at accomplishing a critical sifting of the important modern literature, a selection of all that is useful and needful in bedside therapeutics, and a rearrangement of this mass of knowledge for purposes of quick reference, making it immediately available for practical needs. The magnitude of the undertaking may be gauged from the fact that the book, consisting of eleven parts, deals, in encyclopaedic form, with the following subjects: (1) General medicine and surgery, including the diseases of infancy and childhood; (2) gynaecology; (3) genito-urinary diseases; (4) obstetrics; (5) skin diseases; (6) diseases

[1] *The Diseases of the Breast.* By Willmott H. Evans, M.D., B.S., B.Sc., F.R.C.S. London: University of London Press, Ltd. 1923. (Demy 8vo, pp. xii + 495; 106 figures. 27s. 6d. net.)

[2] *The Heart in Modern Practice: Diagnosis and Treatment.* By William Duncan Reid, A.B., M.D. Philadelphia and London: J. B. Lippincott Company. 1923. (Med. 8vo, pp. 352; 5 plates, 27 figures. 25s. net.)

[3] *Lippincott's Quick Reference Book for Medicine and Surgery.* By George E. Rehberger, A.B., M.D. Philadelphia and London: J. B. Lippincott Company. 1922. (Sup. roy. 8vo; 151 figures. 63s. net.)

of the eye, (7) ear, (8) nose, and (9) throat; (10) orthopaedics, including fractures and dislocations; and (11) drugs—the whole field of practical medicine except psychiatry. To confront the solid phalanx of modern medical works and bring it within the covers of a single volume of not more than 7 lb. in weight (the pages are not numbered) is a decided *tour de force*. To the practical utility of the work the author himself bears witness, and in presenting it to his fellow practitioners he expresses the hope that it will be as useful to them as it is to himself.

That great condensation in the descriptions should be a character of a work of this kind is inevitable, although there are considerable differences observable in the amount of detail given under the various headings, depending, doubtless, on the relative importance attached to each subject by the author, from the point of view of general practice. It is possible that in some instances condensation has been excessive. For instance, taking a few examples at random: no room has been found for clear distinction between cervical and corporeal carcinoma of the uterus, nor for the important diagnostic information to be obtained from inspection and palpation of the cervix in that disease; the entire subject of carcinoma of the breast is dismissed in some one hundred and thirty-six words; and some seventy-five suffice for carcinoma of the oesophagus. No mention is made of the complications of the latter disease, such as perforation of the bronchi, although these probably appear under other headings. On the other hand, many subjects are dealt with in considerable detail. Such is the case with regard to food values, to which ten pages are allotted; the details given extend to such matters as the percentage of fat in chicken-gumbo. For ascertaining information on isolated facts the book should prove of great use, but in the fundamental matter of the knowledge of what may be called the natural history of diseases the general practitioner will still resort to other works in his library.

SANITATION IN INDIA.

McNally's Sanitary Handbook for India,[4] revised by Major A. J. H. RUSSELL, has now become one of the recognized textbooks for students in the Madras Medical College and for the classes of sanitary inspectors. It is addressed primarily "to the educated classes, in the hope that it may afford them information which is important to all and which may serve to benefit them and, through them, the great uneducated masses of the people." The inculcation of the principles of sanitation is the main object of the volume; detailed descriptions of various types of sanitary structures, such as latrines, are therefore omitted. Although written for the Madras Presidency, it applies, with a few exceptions, to all parts of India, and it is nearly as applicable to tropical countries generally. It should, therefore, prove of value in England to medical and civil officers and others who are preparing to go to India or other tropical regions. Written in clear language and dealing with the broad principles of the subject in close association with practical requirements, the book might be read with advantage by English students as an introduction to the more detailed study of hygiene. In India, where even in large towns the majority of the population lives in tiny mud huts, it would seem hardly possible to overestimate the importance of disseminating knowledge of the kind contained in this book. The value of propaganda work has during recent years come to be more and more recognized and is now classed among the regular duties of the medical officer of health. The whole of the health officer's staff of sanitary inspectors is directed to assist in this important duty and every effort is made to co-operate with voluntary workers' associations. No advance in hygiene can be looked for until the sanitary conscience of the people is awakened, and for this the education of the masses needs to be taken in hand. Of the truth of this no better illustration could be given than the native attitude in regard to water pollution. There is no lack of good principle in this matter, for water pollution was forbidden by the ancient religions. Valmiki says, "there is no higher sin than that of polluting drinking water." Although the views of the ancient teachers is in complete accordance with modern views of sanitation, very little attention is paid by the orthodox to their excellent injunctions. A valuable suggestion, applicable to other countries besides India, is that the rudiments of hygiene should be taught in all elementary schools; and some sensible remarks are made relating to the manner of introducing reforms. Existing arrangements, it is stated, faulty though they be, should not be destroyed until efficient substitutes have been provided. Small and partial measures can often be carried out where larger are impossible, and such measures are by no means useless if they are the first steps to further improvement; but, unfortunately, in India "the best" has been too often the enemy of "the good," and as a result even small and partial advances have been indefinitely postponed.

[4] *McNally's Sanitary Handbook for India*. Sixth edition, revised and rewritten by A. J. H. Russell, M.A., M.D., Ch.B., D.P.H., D.T.M., Major I.M.S. Madras: Government Press. 1923. (Demy 8vo, pp. viii + 476. 4 rupees 8 annas.)

THE PSYCHOLOGY OF REASONING.

BOTH the general reader and the student of psychology will be glad to possess in English form *The Psychology of Reasoning*[5] by E. RIGNANO, Professor of Philosophy in the University of Pavia. The book, which has been carefully translated by Winifred A. Holl, owes its origin to the sense of uneasiness and discontent into which the author was thrown by the perusal of some of the best treatises on logic—that science which Russell has described as "one in which we never know what we are talking about, nor if what we say is true." These treatises failed to explain the nature of the logical or reasoning faculty, though purporting to indicate the laws which govern its proper functioning. In order to arrive at an understanding of what reasoning essentially is, the author analyses the simplest and most elementary forms of the process, such as are made use of in the affairs of everyday life. From the study of such cases he arrives at the conclusion that reasoning is nothing else than a series of operations or experiments performed mentally; we do not perform them actually because, by a series of similar experiments that have been really accomplished in the course of our previous experiences, we already know their respective results. The final experimental result, observed with the mind's eye, constitutes the "demonstration" or "conclusion" of the reasoning. This enables us at once to understand why, when we start from certain premisses in agreement with facts, we are able to arrive at results similarly in perfect agreement with other facts; in short, how it is possible for the logical process to give us a representation of reality; the reason being that the logical process is identical with the perceptual reality itself, operated by means of the imagination instead of actually. The author's explanation, further, enables us to trace with great clearness the sources of error and fallacy to which the reasoning process is subject. It has been said that reasoning cannot lead to new discoveries, since we start with premisses consisting of facts already known and since the conclusion is implied in the premisses. The author disposes very effectively of this objection by showing that the imagination proceeds by creating new combinations with old mnemonic elements, and that many of the greatest discoveries have been made in this way, new combinations of old facts indicating conclusions not previously known and which have subsequently been verified by actual experiment. Having ascertained the nature of the reasoning process, the author proceeds to trace its development from the concrete to the abstract form, and in this connexion he makes some interesting observations on the notion of "concepts" and their graphic representatives the "common nouns." The first terms in language are stated to have been common nouns, the use of which was to furnish an "affective classification" of objects—that is to say, a classification based on the needs or interests of the individual. The word "poison," for instance, represents no object, but a class of multifarious objects all possessing one point of affective significance.

[5] *The Psychology of Reasoning*. By Eugenio Rignano. Authorized translation by Winifred A. Holl. London: Kegan Paul, Trench, Trübner and Co. 1923. (Demy 8vo, pp. viii+395. 14s. net.)

Concepts, therefore, are concluded to be, not things of a perceptual order, but groups of affectively equivalent things.

In order to verify the results of his analysis of the nature of reasoning, the author undertakes an examination, from a psychological point of view, of the logical process as it is shown, he considers, in its highest forms in mathematical reasoning. He argues that the fundamental nature of reasoning, as a series of merely imagined operations or experiments, remains without change even when an abstractness pushed to its extremest limit and an excessively complex symbolic form might at first sight seem to conceal this fact.

Although the explanation given of the nature of the reasoning process is relatively simple, the process itself, the author admits, is complex and the resultant of the interplay of a variety of mental activities. To obtain an understanding of the psychical phenomena of which reasoning consists, it therefore became necessary to analyse these phenomena and to reduce them, as it were, to their lowest terms. Thus the author, proceeding from the more to the less complex phenomena, finally arrived on the one hand at sensorial mnemonic reproductions (evocations of past sensations), and on the other at affective tendencies. It was possible to regard either of these as the most elementary of all psychical phenomena on whose interplay all the others depended, but Professor Rignano has succeeded to his own satisfaction in relating both to a quite general and fundamental property of life, which he had already emphasized in his biological writings. The result has been that the work which was conceived as devoted entirely to reasoning has ended as a treatise on Psychology. The fundamental property referred to is "the tendency of the organism to maintain or to restore its stationary or normal physiological state," and the manner in which the whole superstructure of psychology is built up on this single foundation cannot fail to interest the reader.

THORPE'S DICTIONARY OF APPLIED CHEMISTRY.

A NEW edition of a standard work of reference tends ordinarily to follow the lines of previous issues in general character and features. A new arrangement may in some cases be evolved based on the experience gained of the needs of persons who have used the earlier edition, or an expansion of subject-matter may be rendered necessary by new discoveries; but, if after the work has passed through successive editions, and any tendency to variation is followed by a return to type, it is a sure criterion that the work is deserving the appellation of "standard." This rule applies eminently to THORPE'S *Dictionary of Applied Chemistry*, of which Volume IV[6] has been issued In it the quality of the work is well maintained in the character of its contents and in the completeness and recency of the information given. Containing as it does a mass of information known to chemists a generation ago it might have been expected that under certain headings, notably those referring to common materials like limestone, a simple reprint from the last edition would supply all the needful data. Revision has, however, been extended even to subjects of this kind, and signs are everywhere evident that close attention has been given to adding what is likely to be useful and deleting what is of doubtful value. Only a comparison side by side of the articles in this edition with those in the last will show how well the work of revision has been done. Several contributors to the last edition are represented by articles in the present. These include E. F. Armstrong, Herbert Ingle, A. G. Perkin, T. Rose, and L. J. Spencer; among the new contributors are G. Barger, to whom has been allotted a number of articles on vegetable substances having economic relation to medicine; C. T. Bennett, who has revised the subject of essential oils; and H. E. Watt, who has dealt with nux vomica and opium. The article on opium includes a summary of the newer facts relating to the constitution of morphine and contains much to interest those who have been attracted to this subject by the hope of finding an explanation of physiological action in chemical constitution. The monograph on matches is a classical article. It might have been fittingly bound in a separate cover and would have formed a complete treatise on the manufacturing aspect of the industry. As, however, it contains much other matter than applied chemistry, and since available space forms the chief embarrassment to compilation, there is here an obvious danger of inroad in favour of non-chemical technology on the space properly due to chemical matters. In this connexion it is to be noted that whereas no less than twenty pages are devoted to matches, the subject of margarine occupies not much over three. Apart from the subject of matches there is no conspicuous redundancy of matter disproportionate to the scheme governing the whole dictionary. When it is realized how closely the methods and secrets of chemical manufacturers are guarded, the total sum of information here published is very remarkable. It is clear that the new edition is to be fully worthy of its predecessors.

[6] *A Dictionary of Applied Chemistry.* By Sir Edward Thorpe, C.B., LL.D., F.R.S., assisted by eminent contributors. Vol. IV. Revised and enlarged edition. London and New York: Longmans, Green, and Co. 1922. (Med. 8vo, pp. viii + 740; illustrated. 60s. net.)

NOTES ON BOOKS.

The Causes of Cardiac Failure[7] is one of the series of Harvard Health Talks delivered in the medical school of Harvard University to give the public modern guidance on important medical subjects. Dr. W. H. ROBEY points out that it is and always has been quite unscientific to give "cardiac failure" as a cause of death, and adds "in signing a death certificate the best trained physicians have not within the lifetime of many of us given such a meaningless cause." In New York and Massachusetts the death rate from heart disease is higher than that from tuberculosis, but rheumatic fever has become less common, probably from increased attention to oral sepsis. Dr. Robey rightly lays much stress on the prevention of cardiac disease by the detection and removal of focal infections, and describes as potential heart disease the conditions of recurrent infection that may attack, but have not yet damaged, the heart.

The June number of the *Annals of Medical History*[8] has on its cover the portrait of Joseph Leidy (1823–91), the wonderfully versatile naturalist who became Professor of Anatomy at Philadephia in 1853. According to Dr. W. S. Middleton's interesting sketch of his life, Professor Leidy—a relative of Franz Leydig, the well known Bonn biologist—bore a strong resemblance to the conventional Christ in facial expression and was frequently so addressed by children; in addition he appears to have been one of the most charming and modest of men, intellectual giant though he was. This centenary article forms an appropriate sequel to that of his professorial chief and predecessor, William Edmonds Horner, contributed to the spring number of this periodical by Dr. Middleton. The frontispiece is a reproduction of Bernardino Luini's painting of Saint Roch, the patron saint of the plague-stricken, with a bubo on his left thigh; there is an illuminating note on the saint by Dr. Charles Greene Cumston of Geneva, the president-elect of the Fourth International Congress of the History of Medicine, to be held at Geneva in 1925. The stirring story of Louis Heermann's thirty-two years' service in the United States Navy, well told by Captain F. L. Pleadwell and Lieut.-Commander W. M. Kerr, contains a picturesque description of New Orleans when Heermann went there in 1810, only seven years after it was acquired from France. Dr. J. Preston Maxwell and J. L. Liu give an interesting analysis of a Chinese household manual of obstetrics, written about A.D. 1661, which, though not constantly up to date, lays much stress on pre-natal treatment, which is stated to be so good that no medicines are needed. The "Outlines of the History of Medicine in Lower Canada" is the title of an elaborate article by Dr. M. Charlton, the first instalment of which deals with the conditions under the French régime (1608–1759).

Dr. CECIL WEBB-JOHNSON'S book on *Diet for Men*[9] is a popular work which forms a companion volume to *Diet for Women* by the same author. After an introductory chapter in which the inadequate instruction in dietetics in medical education is stigmatized, the writer discourses pleasantly of the various forms of diet, the use of alcohol and other stimulants, diet in sickness and obesity, the effect of emotion on food, the diet of a man over 40, and kindred topics.

[7] *The Causes of Cardiac Failure.* Harvard Health Talks, No. 11. By W. H. Robey, M.D., Assistant Professor of Medicine in Harvard University. Harvard University Press; Oxford University Press. 1922. (Fcap. 8vo, pp. 45. 4s. 6d.)

[8] *Annals of Medical History.* (Summer Number, 1923.) Vol. v. No. 2. Edited by Francis R. Packard, M.D. New York: Paul B. Hoeber Inc.; London: Baillière, Tindall and Cox. (8¾ × 12½, pp. 95–188; illustrated. Subscription in Great Britain, £2 2s. for four numbers.)

[9] *Diet for Men.* By Cecil Webb-Johnson, M.B., Ch.B. London: Mills and Boon, Ltd. 1923. (Post 8vo, pp. v + 192. 5s. net.)

Nova et Vetera.

AN EIGHTEENTH CENTURY PRACTITIONER'S LEDGER.

THROUGH the courtesy of Mr. C. F. Harriss, Solicitor of Newport, Salop, who is Secretary of the Shropshire Panel Committee, we have been able to look through the professional ledgers of an eighteenth century medical practitioner, William Coyne, of Holywell, Flintshire. These leather-bound volumes, three in number, are of uniform size and cover a period of more than a quarter of a century; the earliest entries refer to the beginning of the year 1746 (O.S. 1745), and the last are dated December, 1773. All that Mr. Harriss can say about the books is that he found them when clearing out one of the attics of his office, where he has every reason to suppose they had lain for over a hundred years. The firm of solicitors of which he is now the head dates back to the eighteenth century, and the distance from Newport to Holywell across the Welsh border is not great.

In shape and size the ledgers correspond with a country doctor's day-book of the present day; the pages are faintly ruled for the dates, and for pounds, shillings, and pence; the entries are in several handwritings of varying legibility. Mr. William Coyne was evidently a country apothecary in a good way, and, like so many of his contemporaries, he not only compounded and supplied drugs, but prescribed remedies and visited patients. Occasional entries show that he dressed wounds and set fractures; records of venesection ("V.S. in brach. 1s.") are fairly frequent; of midwifery practice there is no trace. The records make it plain that, though sparing in phlebotomy, he drugged his patients as copiously and as often as any practitioner of the time.

The ledgers form a straightforward record of things supplied and charged for, with little or no comment, and scarcely any touches which reveal anything of the man himself. The various accounts are arranged under the name of the householder or that of the individual patient. Many of these were persons in humble circumstances—gardeners, joiners, miners, and such like—but the practice would nowadays be described as "mixed." The more prosperous patients included members of the landed gentry, a merchant or two, "Mrs. Jones next door," several "officers," many farmers, and the local exciseman; grocers and butchers and publicans, a perruque-maker, and, in short, every kind of tradesman, large or small; together with the local attorney and schoolmaster and other professional men.

The mainstay of the practice was the head of the house of Mostyn. As is seemly, the first folio of the first volume opens with the record of William Coyne's enormously long account with Sir Thomas Mostyn, of Mostyn, and his successor in the baronetcy. During the twenty-eight years covered by the ledgers, many of Coyne's patients were members of the Mostyn family, who are prominent in the district to this day. Thus, the eleventh baronet, Sir Pyers Mostyn, has a seat in Flintshire, and Lord Mostyn, the third baron, owns Mostyn Hall, Holywell. Sir Thomas, and after him Sir Roger, were a considerable source of revenue to Mr. Coyne: scarcely a week passed without several items being charged to the baronet's household account. The usual fee for a journey to Gloddeth was one guinea, and five shillings to Mostyn Hall. In addition to this visiting fee, the baronet was debited with various amounts for medicines supplied on the same day to any members of the family or of the retinue or of the livestock who happened to be ailing at the time. Thus on one very moderate afternoon Master Daniel, Master Tommy, and Miss Mostyn (who was bled as well) all needed doses of Pulv. Alterat.; Betty the housemaid had Haust. Purg.; and Flor. Sulphur. and Bol. Armen. were prescribed for occupants of the stable. The household was large and the outdoor servants and other retainers numerous. Mr. Coyne's patients among the indoor staff included the housekeeper and the cook, footmen, housemaids, laundrymaids, dairymaids, kitchenmaids, and turnspits, together with the Rev. Mr. Edwards the domestic chaplain, Mr. Lloyd the steward, and Mrs. Trim the nurse; the outdoor staff included gamekeepers, grooms, coachmen, ploughmen, postillions, husbandmen, poultry women, cowmen, carters, and stable-boys. Besides these, Sir Thomas Mostyn made himself responsible for medical attendance upon unidentifiable persons such as Mr. Wynne and Mr. Blundell, who may have been visitors or perhaps resident librarians, and upon ancient retainers described as "Old Ellis," "Old Richard," "Old Mostyn," and the like. The account was discharged in lump sums at odd times by the house-steward.

Another long account, which drags on from folio to folio in the third volume, is that for visits and medicines to the household of Lord Grosvenor at Halkin. Some loose sheets of paper, preserved with the ledgers, include a stained and blotted fragment from the day-book of 1757; also a list of Mr. Coyne's principal patients in the year 1769 together with the sums due to him from each. On this appear the names of Lord Grosvenor, Sir Roger Mostyn, Bt., the Dowager Lady Mostyn, Sir Watkin Williams Wynne, Bt., and a considerable sprinkling of the clergy.

Looking through the ledgers we find entered up under the various patients' names innumerable pills, juleps, electuaries, mixtures, draughts, powders, boluses, drops, infusions, decoctions, linctuses, apozems, elixirs, and stomachic tinctures; also outward applications—plasters, balsams, liniments, embrocations, blisters, dressings; and, every now and then, the administration of a clyster. Manna was often supplied, presumably for the nursery. The endless tale of dull medicaments is relieved by occasional items such as "Fruct. limon. ii, 4d.," "Six large bladders," "A bottle of bitters, 4s.," "Best gold leaf, 2 books, 3s. 6d." In Widow Morrell's account "a quire of writing peaper, 6d." appears several times; and, stranger still, Edward Roberts, Esq., of Denbigh, is debited with a silk plaid waistcoat at £2 2s.

Mr. Coyne's surgical practice was not extensive. It was confined for the most part to emergencies, such as the reduction of fractures and dislocations, and attention to injuries. At rare intervals we find records of minor operations; for example, "opening ye sinus and dressing," "opening a tumour in his groin," "scarifying," "amputat. digit. and cure."

An astonishing account is that of Miss Salisbury. It opens in the third volume under date November 18th, 1769, and continues through fifteen folios, each containing fifty or more separate entries. The last item is dated June 10th, 1771, but the record, though broken at that point, was continued in another volume, lost long since. Between those two dates, some eighteen months apart, never a week passed, and seldom a day, without Miss Salisbury receiving a draught or some aromatic spirits or a bottle of Bristol water from the attentive Mr. Coyne. She paid him £58 odd on February 23rd, 1771, and owed about £15 when the account passed into the next ledger.

One of the folios contains "an account of what goods came in for the year 1771." From this it appears that Mr. Coyne's stock-in-trade was mainly replenished from two sources—Mr. Wilson, druggist of Chester, and Mr. Ellams, druggist of the same city. Goods to the value of £4 11s. 8d. were bought from the former, including four shillings' worth of corks and half a guinea's worth of gallipots. Mr. Ellams's account was larger—nearly £14. Phials costing £1 17s. 2d. were purchased from Mr. Seamen of Warrington, and supplies of "selter" water and other unnamed commodities came from a Mr. Hegg. On April 29th forty-seven pounds of butter were bought for a guinea!

Before concluding this note it should be mentioned, perhaps, that Mr. Coyne was very lenient in his charges to the clergy for professional services and medicines. One parson's bill, containing twenty-three items, amounted to no more than 11s. 3d., and another was charged nothing at all. Professional colleagues (Dr. Parry of Caerwys, and Mr. Blount, a neighbouring apothecary) were treated with the same consideration; sometimes a small charge was made for drugs supplied, but more often nothing. The third ledger closes sententiously with a Latin tag, written in a large copper-plate hand on the inside of the cover:

Sic transit gloria mundi.

British Medical Journal.

SATURDAY, NOVEMBER 17TH, 1923.

MELANOSIS.

THE function of pigment in the biological world appears to be similar to its function in the industrial world: it is either decorative or protective. One kind of painter adorns our drawing-rooms with works of art, whilst another preserves wood and iron work with a protective coat of coloured varnish. The delicate shades on the feathers of birds, the ingenious camouflage of certain insects, and the varied colours of the coats of other animals serve as an ornament, inciting admiration, or as a protection, acting as a warning or a disguise, or as a defence against the rays of the sun.

The pigment melanin is of great interest in human pathology because of its presence in the tumours melanoma and melanotic cancer. Mr. W. G. Spencer, in his Bradshaw Lecture on melanosis published this week (p. 907), with a large series of illustrations on a special plate, declares that there is no essential difference in the melanin which may be obtained by macerating the skin of a negro, or from the ink of a cuttlefish, or from a melanotic tumour. The pigment is formed from a colourless mother substance melanogen, which becomes oxidized to melanin. Melanogen is constantly present in the skin, as is shown by the fact that sections of dead skin slowly darken in colour, due to the formation of melanin; the same process may take place in living cells as the result of exposure to the sun or the action of chemical reagents. Melanogen is the normal precursor of melanin, and the presence of melanogen can be demonstrated in the cells of the epidermis and hair follicles of the foetus and in the embryonic cells of the retinal epithelium before any appearance of pigment. When injected into the circulation a solution of melanin appears to possess properties very similar to those of adrenaline, and Mr. Spencer is of the opinion that the pigmentation which occurs in Addison's disease, and also in dogs after the removal of the adrenals, is due to the accumulation of a mother substance common to adrenaline and melanin. The interference with the normal function of the adrenals, whereby they fail to take up this circulating mother substance and convert it into adrenaline, appears to lead to the deposition of large quantities of melanogen in the cells of the epidermis, to form melanin by oxidation.

The function of melanin, like that of other pigments, is either decorative or protective, but it is only the latter function which need concern us at present. The secretion of the ink-sac of the cuttlefish is discharged into the water to obscure the movements of the fish by colouring its surroundings. The deep brown pigment sepia may be obtained by dissolving the dried contents of the ink-sacs in dilute ammonia or soda solution, and reprecipitating with hydrochloric acid. Mr. Spencer describes the formation of this pigment in the cytoplasm of the epithelial cells lining the ink-sac of the cuttlefish, and illustrates the production of this melanin pigment. A different example of the protective properties of melanin pigment is provided by the arrangement of the granules in the ova of frogs; at first they are unpigmented, but later granules of melanin appear in the cytoplasm and serve to protect against the harmful effects of sunlight whilst the ova are floating in the water. In the human foetus melanin pigment begins to appear in the fourth month in the epithelial cells forming the outer layer of the optic cup; in the seventh month pigmented cells are found alongside the blood vessels of the choroid which has developed from the mesoblast; the full pigmentation of the posterior layer of the iris is not complete at birth.

The pigment which is produced in the epidermis and the eyeball has a protective function and serves a useful purpose, but of what value are collections of pigmented cells in deeper structures? Probably none at all in the fully developed animal, though they may have been of value at an earlier period. Thus in the embryos of bony fish the pigment cells spread out from around the neural groove and canal in relation to the primitive body segments, and a similar explanation may account for the stripes, patches, and markings on the coats of higher animals. Such considerations have led Mr. Spencer to formulate the following hypothesis: "It seems, therefore, a rational explanation that melanin pigmented cells, whether superficial or deep, have primarily developed around the neural tube, originally for the protection of the central nervous system. The pigmented cells have spread first into the epiderm, then deeper into the mesoblast of the immediate neighbourhood, and further have been carried away in the parietal and visceral layers of mesoblast along with outgrowing nerves, especially sympathetic nerves."

The physiological formation of melanin is therefore capable of explanation, but the pathological production of this pigment is shrouded in the mists which obscure the development of all new growths. We know of certain agents which are capable of oxidizing the melanogen normally present, and which accordingly appear to increase melanin pigmentation. The black spots which follow the bites of the body louse, the pigmentation which is produced by excess of arsenic, the development of freckles after exposure to the sun, appear to belong to this category. In certain disorders of the endocrine glands increased pigmentation may occur, and an explanation has already been offered for the darkening of the skin which occurs in Addison's disease, by assuming that melanogen is deposited in the epidermis instead of being converted by the kidneys into adrenaline. A curious example of the "banking up" of melanin pigment is provided by the tumours so frequently appearing in grey horses, which in old age tend to become white through the loss of pigmented hair. No change takes place in the unpigmented skin, but any area, such as the ano-genital region, of normally pigmented skin is likely to become the site of a melanotic tumour.

The insidious change whereby a congenital melanoma assumes the character of a melanotic cancer remains a mystery, but research has shown that migration of branched pigmented cells may precede any sign of cancer. Wounds of the skin which have resulted in a small pigmented area may after years of quiescence suddenly assume the character of a malignant melanotic growth.

Variations in the amount of pigment in the eye are very frequent. The name "wall eye" is applied to a condition observed, particularly in the horse, in which there is a large amount of white showing, or where there is absence of colour in the iris or a dense opacity of the cornea. The expression, it may be noted in passing, is derived from the Icelandic word for a beam or sty in the eye. But such variations in pigment rarely lead to melanotic cancer. When such

malignant disease does occur in the eye it generally arises from the pigmented layers within the eyeball, and develops as a rule after middle life.

The occurrence of melanotic cancer in other regions of the body—such as the hard palate, the abdomen, the ano-genital region, and the pia mater of the brain and spinal cord—is difficult to account for. It is easy to find a satisfactory explanation for the physiological development of melanin pigmentation; it appears in obedience to definite laws and serves a useful purpose. We are in complete ignorance of the laws which govern the pathological development of this pigment in melanotic cancer. Vague hints and slender clues may be furnished by a study of comparative pathology, and these are worth pursuing. But the uselessness of tumour growths is their most baffling property, for, just as crime is most difficult to detect when there is no apparent motive, so morbid processes are most difficult to understand when they have no obvious object.

THE INSURANCE CRISIS: THE DECISION.

The special Conference of Representatives of Local Medical and Panel Committees, called by the Insurance Acts Committee to consider the Minister of Health's revised offer, was held on Wednesday, November 14th. It will be remembered that the Minister's offer, conveyed in a letter published in the Supplement of November 3rd (p. 209), contained certain declarations and two alternative proposals. Sir William Joynson-Hicks declared in the first place that medical benefit is a primary benefit and that there is no title to additional benefits until this and the other primary benefits—sickness, disablement, and maternity—are provided. In the second place he declared that the remuneration of practitioners is a matter to be considered on its merits and agreed by negotiations between the Minister and the profession. In regard to the immediate question of remuneration the Minister offered, alternatively, a guaranteed fee of 8s. 6d. for five years, or a separate and immediate inquiry into the appropriate capitation fee for 1924.

At the reassembling of Parliament on November 13th several questions on this subject were put to the Minister of Health, who in his replies indicated that a fuller statement from him might be expected on Thursday after the decision of the Panel Conference. In the meantime he informed the House of Commons that if the offer he had made was accepted by the Conference he proposed to lay on the table a White Paper on the whole subject, which would include an actuarial report. Upon this Sir Ryland Adkins asked, "Is it an agreement assented to by the Approved Societies?" To this the Minister made the following significant answer: "No, sir. I, as Minister of Health, after fully considering the whole matter, have made alternative proposals to the doctors. If either of these proposals is accepted legislation will be necessary, and I hope to have the responsibility of bringing in that legislation and submitting it to the House."

The Panel Conference, having "heard great argument about it and about," resolved by 141 votes to 29 to accept the Minister of Health's offer. The Conference then discussed the advantages and disadvantages of the Minister's two alternatives *a* and *b* embodied in his offer. After close debate, revealing differences of opinion, alternative *b* was accepted by 123 votes to 49. A motion to accept the Minister's offer, including alternative *b*, was then put to the meeting as a substantive resolution and carried unanimously. The result of the Conference is therefore the acceptance on behalf of insurance practitioners of a special Court of Inquiry to be set up by the Minister as soon as possible and instructed to report on the capitation fee to be paid as from January 1st next. The contract will be made on the basis of the fee recommended by the Court of Inquiry, the Government undertaking to go to Parliament for the necessary legislative sanction and the profession undertaking to accept the recommendation.

THE BRADSHAW LECTURES.

The Bradshaw Lectures at the two Royal Colleges in London were delivered this year at the Royal College of Physicians by Dr. John Hay, physician to the Royal Infirmary, Liverpool, on November 1st, and by Mr. W. G. Spencer, surgeon to the Westminster Hospital, at the Royal College of Surgeons; the latter lecture is published this week (p. 907), and we hope to give some account of Dr. Hay's lecture, which was concerned with the prognosis of angina pectoris, in an early issue. The lectures were founded by his widow in 1880 in memory of William Woods Bradshaw (1801-66), who became a member of the Royal College of Surgeons of England and Doctor of Medicine of Erlangen in 1833, a Fellow of the Royal College of Surgeons in 1854, an extra-Licentiate of the Royal College of Physicians in 1841, and a member in 1859. In the Bradshaw Lecture for 1910 (vide British Medical Journal, December 10th, 1910) at the Royal College of Physicians, Dr. Newton Pitt, in giving some details and a photograph of Dr. Bradshaw, mentions that at the mature age of 43 years he matriculated at Newton Hall, Oxford, and was granted a degree without examination. He was an M.D. and D.C.L. of that university, and is described as "a cultivated, refined, and somewhat eccentric man with a rather theatrical manner who never did much practice." His wife was the widow of a wealthy jeweller at Andover, whose money was to be forfeited in the event of remarriage, but after purchasing the reversion she and Dr. Bradshaw married and settled down at Reading. As originally directed the lectures were to be given on the anniversary of Dr. Bradshaw's death, August 18th, but in 1891 the sanction of the Charity Commissioners was obtained to depart from this date. These annual lectures were given for the first time in 1881, and at the Royal College of Physicians the late Dr. Vivian Poore took for his subject "The nervous affections of the hand"; other lectures notable for bringing new information to the notice of the profession were the late Professor W. S. Greenfield's "On some diseases of the thyroid gland" (1893), which gave the first full account of the histological lesions of the gland in exophthalmic goitre, and Sir Thomas Barlow's "Infantile scurvy and its relation to rickets," the completeness of the description being responsible for the name "Barlow's disease," a term perhaps less familiar in this than in other countries. It may also be noted that exophthalmic goitre formed the subject-matter of the two other Bradshaw Lectures at the same College by Professor George Murray in 1905 and by Sir Hector Mackenzie in 1916.

PSYCHIATRIC PROBLEMS OF THE FUTURE.

An address which touched on many subjects and gave to each of them a philosophical significance was delivered to the Section of Psychiatry of the Royal Society of Medicine on November 13th by the new president, Dr. T. B. Hyslop. He traced the progress of psychology since his presidency of the Section of Psychological Medicine at the British Medical Association meeting in London in 1910. During the intervening years the civilized portion of the globe had undergone such a violent upheaval that the thoughts of every person must have been drawn to the question

whither humanity tended. Evolution and devolution were constant throughout the universe, but the human mind curiously claimed exemption for itself from the process of devolution. Men noted with complacency the rise and fall of nations and civilizations, knew that worlds were born and died, and in their rational selves were aware that this world must conform to its allotted destiny; yet we were blind to its ultimate devolution. The philosophical conclusion arrived at from the data of physics and psychology was that mind in its ultimate essence was coextensive with energy. From Myers's doctrine of the subliminal self there had followed a flood of conjectures, some of which appeared to be legitimate. Sir Oliver Lodge endorsed the view that the individual was but an incomplete fraction of a larger self, a portion only of the whole self, which was in intimate contact with matter. Dr. Hyslop agreed with the view that in the association of spirit with matter the incarnation of something pre-existent appeared to be a reality, and that the gradual utilization of matter by pre-existing life or spirit might really occur. He asked that in dealing with such problems a greater measure of tolerance should be shown. He next dealt with the attempts which had been made to localize mental states to certain physical areas; these attempts had not so far had much success. By destroying or severing the connexions of any of the cortical areas existing activities might be cut off or the results of former activities rendered inert, but beyond that it was not possible to go. With further advances in knowledge of the data of consciousness and of brain structure there might be formed some definite doctrine of cerebral localization, but the answer of cerebral anatomy and physiology to the question of the localization of consciousness had been of little value hitherto. The activity of the sense organs was undoubtedly determined originally by cosmical means outside the body, but those means had to be changed and modified before they could determine consciousness. Even though the ideal elements of science were reached there would still be no explanation of how the physical organism developed specific forms of motion upon which consciousness was superimposed. The nerve cell, in his view, consisted of two distinct elements, one neuroplasmic and the other trophoplasmic. He saw in each nerve cell nothing else than modifications of the neuroplasmic fibrillae and the trophoplasmic adjuncts. Each cell was but a station or junction where the neuroplasmic fibrillae were structurally continuous and had for their common use a comparatively large trophoplasmic process. The long discussion as to the individuality of the neuron lost its difficulty to a great extent when these two factors were considered—a continuous neuroplasm, and a trophoplasm which was contiguous, and acted through its relations to the neuroplasm or its dependence on biochemical or other influences from without. The neuron theory had never been adequate, and it ought to be supplemented by the trophon theory. The trophon was to all intents and purposes a structural and functional equivalent to a pulsatory lymphatic heart, deriving its activities and energies from chemico-physical changes within the neuroplasm. The trophons were probably during life subjected to pressure due to various causes, including mechanical. It was reasonable to conjecture that mental abnormalities were due to the disruption or short-circuiting of currents in nerve tracts originating in either the trophon or the neuron. Dr. Hyslop held to the view that the nervous system was a mechanism for the transmission of force, and not a generator of force. The nerve fibrillae were purely conductors in function. The nerve cell or the trophon did not initiate energy, but simply supported, protected, and nourished the fibrillae. The progress of psychiatry had been slow and laboured. It was not to be compared with the progress of surgery and certain departments of medicine. But the methods of Freud and his disciples had during the last few years led in some instances to a more thorough understanding of various mental states. The study of the physiology of the nervous system had shown the value of the experimental destruction or excitation of the accessible microscopical parts, but the anatomical facts, instead of elucidating the problems of the physical basis of mental processes, had tended rather to increase the difficulty of understanding the complex mechanism of the nervous system. Science and religion were coming more and more into accord as the knowledge of realities became more manifest, and it was not out of the question to think that a creative and an emergent evolution might be shown to be in complete agreement. Science needed the background of eternity.

CANCER CURERS.

THERE are in most big towns persons who profess to be able to cure cancer by drugs to be taken internally, or by local applications—"without the knife," as the saying is—but it is probably in rural districts and in their small market towns that the curers by lotions, ointments, and plasters most flourish. They do much harm; they are the cause of great suffering, physical and mental, but their practice is not illegal, and while they avoid certain obvious pitfalls they can continue so long as the local public is willing to believe their promises. Occasionally, however, they are not sufficiently astute to avoid the long arm of the law. A case heard recently in the Doncaster County Court before His Honour Judge R. W. Turner presents certain features, particularly the terms of letters written by the defendant, which are worthy of note. The following account is founded upon reports in the *Yorkshire Herald* and the *Yorkshire Post*. The case came on first on October 24th; the plaintiff, the wife of a labourer in the village of Bentley, sued the defendant for the return of £11 paid to him for the cure of cancer, which had not been carried out. The defendant issued a circular in the form of a letter in the course of which he said, "I am willing and prepared to accept any cancer case and to cure them thoroughly without any operation whatever. . . . After I prove my abilities I will sell my remedy to any medical gentleman or physician for a reasonable sum or stand in with them. . . . No cure no pay." The case was adjourned to enable the claim to be amended. At the second hearing, on November 7th, the claim was for the return of £11 fees for the treatment of cancer, damages for breach of warranty, and damages (£50) for pain and suffering. The plaintiff, who had been a patient of Dr. Ashurst of Bentley, was found by him to be suffering from a tumour which was not cancerous. He recommended her to go to the Sheffield Infirmary; she was there offered admission with a view to operation, but refused. She then went to see the defendant. He was not at home, but afterwards wrote her a letter, dated June 23rd, as follows:

> Dear Madam,—Guaranteed. Call about 12.30 p.m. Sorry I was not at home this evening on your calling. To speke candid I am scarcely at home, allways on the prowl or detained. Some persons want me. But nevertheless as a servant of the Most High God. The blessing that He as bestowed upon me more than mankind I only wish all blessings to go to my God of the Heavins. If you can pay me each week for the drugs that you require to destroy all the roots, the fangers, and to draw the cancer cord away, I will cure your boosom, chest, and system and make a sound cure of you; then give me for my trouble what you can afford and oblige.—Yours obediently,
>
> David Williams.

On June 28th the defendant called and examined the plaintiff, and told her that she was suffering from cancer, but he could cure her in a month or six weeks; she agreed to pay him £2 a week. He supplied her with a lotion, a green ointment, which brought on boils and blisters, and

also put on a plaster. During this treatment she suffered much pain. Mr. John Adams, public analyst, Sheffield, said that the lotion was partly ammonia; the ointment blue vitriol, sugar of lead, and bread; and the plaster mainly tar. For the defence it was urged that the defendant had used a method described in John Wesley's *Common-sense Medicine for Common-sense People*. When the judge remarked that science had advanced since then, the reply was that the method was a resuscitation of an old-world remedy for cancer, and that evidence of some success could be produced. The judge did not accept this statement, observing that the evidence at present was that there is no cure for cancer. In giving judgement the judge said that the defendant had had the money and must return it to satisfy the terms of his advertisement, "No cure no pay." These classes of people, he went on, were always talking of their alleged successes, and there was a class of people who always believed them. The judge entered a verdict for the return of the £11, with £30 for pain and suffering. The judge said that the case was important to the public, and gave costs on Scale C, with qualifying fees for the analyst and the doctor. The judge's observations were so much to the point that it does not seem necessary for us to add anything by way of comment.

WINTER SPORTS IN FRANCE.

Few people associate the Riviera with snow and winter sports, but in the article on wintering on the French Riviera published a year ago (October 28th, 1922, p. 815)—an article which deservedly attracted much attention and has been helpful to many, both would-be visitors and their medical advisers—it was pointed out that there were many places in the Alpes Maritimes where a true mountain climate could be reached within an easy journey of the Mediterranean. The writer of that article had in mind chiefly the use of such places to escape the summer heats, but we learn from a leaflet on winter sports in France that one place at least in that district is laying itself out to attract winter snow-lovers. This is Peira-Cava, at an elevation of 4,757 feet, within 40 kilometres of Nice, from which it can be reached by motor omnibus. The French are, in fact, showing a great deal of enterprise in establishing winter sports stations. The two highest are in the Pyrenees—Font-Romeu and Luchon-Superbagnères; both, curiously enough, are 5,906 feet high, and at both new and well appointed hotels have been built. Font-Romeu is in the Eastern Pyrenees and is surrounded by forests; it can be reached from Paris in thirteen hours. Bagnères-de-Luchon in the Central Pyrenees (fifteen hours from Paris) is a well known summer watering place with thermal sulphur springs, at a height of 2,066 feet; Superbagnères stands in an open situation 3,840 higher up; it is reached by a funicular railway in about an hour. In addition to the large new hotel there, every class of hotel is to be found at Bagnères-de-Luchon itself. Cauterets, also in the Pyrenees, hitherto known as a summer resort, is now seeking to attract the winter visitor also; it has the advantage of presenting a considerable choice in hotels, but it is only 3,363 feet high, which some will think not high enough. The jumping-off place is Pau. St. Pierre de Chartreuse, a village on the road from Grenoble to the monastery, is described as a quiet place having arrangements for sports; it is 3,117 feet above sea-level. Another high-lying place in quite a different district is Mont Revard, at an elevation of 5,068 feet; it is eighty-five minutes by a mountain railway from Aix-les-Bains, of which it seems to be looked upon as an annexe, but it has a small hotel of its own. Mégève (3,750 feet) in Savoy is said to be especially good for ski-ing, and there is always Chamonix (3,409 feet), where the winter sports section of the eighth Olympic Games is to be held this winter, when the annual international ski-ing competition organized by the French Alpine Club will take place for the French challenge cup. Full information about all the places mentioned and how to get to them can be had from the Office Français du Tourisme, 56, Haymarket, London, S.W.1.

VACCINATION PROPAGANDA.

We publish elsewhere in this issue a letter from Dr. Killick Millard with reference to the editorial article entitled "Vaccination propaganda" in our issue of November 3rd (p. 826). Dr. Millard accepts our correction of his error as to 165 deaths attributed to vaccinia; but as to his other erroneous statement with regard to the conscience clause he makes a defence of which he gave no hint in what he wrote in the Journal of September 29th (p. 564). He there spoke of the conscience clause "proposed as a result of the Royal Commission's report"; he was therefore referring to the clause of the Act of 1898, not to the altered clause in the Act of 1907. In his letter published this week he introduces fresh matter. By his quotation from Sir William Hamer's report he shows that he appreciates the great value of the Ricketts-Wanklyn method of diagnosis for the prevention of epidemics; but he goes on to say that he is convinced that further aid in dealing with small-pox of the old type would be obtained by refraining from the practice of infant vaccination, because then an attack of small-pox would be more severe and therefore more easily diagnosed. "Had these cases," he writes, "been unvaccinated the attack would have been much more severe and their nature much more obvious, and almost certainly they would not have been overlooked." Such severity would of course be attended by more pitting of the skin in the event of recovery, and by a higher mortality among persons attacked. The vicarious beneficiaries would be the children of parents who in no case would have had them vaccinated, either through mere neglect or through disbelief in vaccination. In short, certain children are to be immolated on the altar of diagnosis in order to protect other children whose parents refuse to give them the protection of vaccination. It is apparently for their sake that those who would otherwise have been submitted to vaccination are to be left unprotected. The sympathy of everyone will be with the bereaved parents of infants who have been infected with sepsis or erysipelas after vaccination, however the infection may have been brought about. But are we to have no sympathy with the proposed victims of easier diagnosis? On the one hand, erysipelas is a rare sequel to a measure of the greatest protective value. On the other, severe small-pox might be the result of omitting to bring influence to bear in support of the protective operation.

AGGLUTINATION OF DIPHTHERIA BACILLI.

The Ministry of Health has issued a paper[1] by Dr. W. M. Scott on the agglutination reaction of diphtheria bacilli. It is a contribution to practical questions concerning the carrier problem and to the discrimination between pathogenic and non-pathogenic types of the bacillus. These types are indistinguishable by cultural and morphological tests; Dr. Scott set out to determine whether they could be distinguished by their serological behaviour. In studying 265 strains he found eight main serological groups, but there was evidence of other groups not identified. Six of these groups contained only toxigenic strains, while the remaining two included toxigenic and non-toxigenic cultures. The unidentified strains and also the non-virulent (but otherwise typical) strains were much commoner amongst contacts and carriers than amongst

[1] It forms part of No. 22 Reports on Public Health and Medical Subjects. Issued by the Ministry of Health. H.M. Stationery Office (2s.) or through any bookseller.

convalescents and acute cases. The non-toxigenic strains which conformed to the ordinary microscopic and cultural standards of *Bacillus diphtheriae* were also found to respond to the serological tests of virulent bacteria proving membership of this species; but this was not the case with the strains which are commonly described as "atypical diphtheroids," a fact which provides further evidence that such strains are not true diphtheria bacilli. A study of the relationship of different antigenic types of diphtheria bacilli to different epidemics showed evidence of association of particular epidemics of diphtheria with particular serological groups of the bacillus.

FAR EASTERN ASSOCIATION OF TROPICAL MEDICINE.

The fifth congress of the Far Eastern Association of Tropical Medicine was held in September at Singapore, and was attended by over 300 medical practitioners, representing fifteen countries. The president of the congress was the Hon. Dr. A. L. Hoops, principal civil medical officer, Straits Settlements. The association was founded in 1908, when a small gathering of medical men met at Manila, and the first congress was held in the same city in 1910. The second congress was held at Hong-Kong in 1912, and the third congress at Saigon in 1913. The war caused a lapse of eight years, and the fourth congress was held in 1921 at Weltevreden in Java. It is intended to hold the next congress two years hence in Tokio, at the invitation of the Japanese Government. In his presidential address Dr. Hoops gave a brief survey of the work that had been done in the last twenty-five years in tropical medicine, and indicated the directions in which further work was still necessary. He said that for the widespread practice of preventive medicine an educated public, co-operating with educated medical officers, was required, and the mainstay of prevention in rural districts must be the rural practitioner. He insisted that there was nothing inherently unhealthy in a tropical climate, and there was no reason why the figures of the death rate and infant mortality rate in England should not be approached in the tropics.

WOMEN'S MEDICAL SERVICE FOR INDIA.

The Council of the Countess of Dufferin's Fund has issued its thirty-eighth annual report on the work of the National Association for supplying medical aid to women in India. The publication includes the ninth annual report of the Women's Medical Service for India. At the beginning of 1922 this service consisted of 38 medical officers with 4 temporary officers. The number of women medical students was 436, and there were altogether 400 women practitioners of medicine in India, as many as 145 hospitals being staffed by women alone. These figures indicate the great advances which have been made in providing medical aid by women since 1885, when the Dufferin Fund was formed. Large areas are, however, still unprovided with medical relief by women. Statistics compiled by the public health departments of the various provinces show a large excess of deaths among women at the child-bearing age, pointing to a high mortality at the time of childbirth. Moreover, infant mortality in India is still excessively high. The Council of the Fund thus summarizes the chief needs of the country as regards medical aid by women: (1) A far greater number of hospitals staffed by women; (2) a far larger supply of Indian women doctors both for hospital and private work; (3) more opportunity of post-graduate work to keep up the standard of professional knowledge; (4) training schools for nurses and midwives in connexion with every women's hospital; (5) more funds for the working of the hospitals in order that thorough and efficient work may be carried on; (6) a constant supply of women doctors, nurses, and midwives to take up preventive work in connexion with maternity and child welfare in all parts of the country.

The first David Lloyd Roberts Lecture will be delivered at the Royal College of Physicians of London on Tuesday, November 20th, at 5 p.m., by Mr. Edmund Gosse, C.B., LL.D. The subject of the lecture is "Personal relations between medicine and literature."

Sir William Macewen was the guest of the California Academy of Medicine, San Francisco, on September 20th, on his way to Australia as representative of the British Medical Association at the Australasian Medical Congress. He addressed an assembly of about 150 medical practitioners, among whom was Dr. Ray Lyman Wilbur, president of the American Medical Association.

On Thursday, November 29th, at 5.30 p.m., Sir W. J. Collins, M.D., will give a lecture at University College, London, on the life and doctrine of Sir Edwin Chadwick. Tickets of admission can be obtained on application to the Secretary of the College.

Sir Donald MacAlister, K.C.B., Principal of the University of Glasgow and President of the General Medical Council, has been appointed a Deputy Lieutenant of the city of Glasgow.

Medical Notes in Parliament.

[From our Parliamentary Correspondent.]

The General Election.

On the reassembling of the House of Commons on November 13th, Mr. Baldwin announced that he had decided to advise His Majesty to dissolve Parliament on Friday, November 16th, which means that a general election will take place on Thursday, December 6th. He explained that this resolve was taken on account of the grave problems of unemployment, and because he had reached certain conclusions he could not act upon unless he were relieved of the pledge given by Mr. Bonar Law as affecting the present Parliament. He thought that as in these circumstances a general election was necessary, it should take place at the earliest possible time. Hence the choice of date.

It is hoped that the new House will meet on December 10th for the swearing-in of new members, and after two or three days will adjourn until the end of January, when the business of a new session will begin.

The Government majority over all other parties in the House of Commons at the present time is 73. One result of the declaration of fresh policy by Mr. Baldwin is that the two wings of the Liberal party have come to an agreement to work together.

The Panel System.

Sir Kingsley Wood asked the Minister of Health on November 13th whether he could state the present position of the negotiations with the doctors on the panel lists concerning their duties and remuneration; and whether he had conferred with the approved societies in relation to such matters. Sir William Joynson-Hicks replied he had now made two alternative offers to the doctors, which would be considered by the conference on November 14th. As regards the second part of the question he stated that for some months past a series of consultations had been taking place with the Approved Societies' Consultative Councils of England and Scotland, and, in addition, conferences had been held with representatives of the various important groups of approved societies in Great Britain in relation to both duties and remuneration.

In reply to further questions, Sir W. Joynson-Hicks said that if his offer was accepted he hoped to lay on the table a White Paper on the whole subject, including an actuarial report. Asked whether the agreement had been assented to by the approved societies, Sir W. Joynson-Hicks said, "No, sir. I, as Minister of Health, after fully considering the whole matter, have made alternative proposals to the doctors. If either of these proposals is accepted legislation will be necessary, and I hope to have the responsibility of bringing in that legislation and submitting it to the House."

COMMERCIAL INFLUENCES IN THERAPEUTICS.

BY

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On taking the chair as President of the Section of Pharmacology and Therapeutics of the Royal Society of Medicine on November 13th, Professor CLARK, after thanking the Section for the honour it had done him, gave an address on the influence of commercial interests on therapeutics, in the course of which he made the following observations:

Certain work, done during the past few years, in examining widely advertised proprietary medicines, impressed upon me the light-hearted manner in which some firms made sweeping therapeutic claims for their products; claims in support of which they had little or no direct evidence. In addition I found that even when evidence was laboriously collected which indicated that these claims were erroneous, it usually made no difference in the advertised claims. This naturally caused me to inquire what safeguards existed in England to ensure that the claims made in advertisements of drugs were at least not demonstrably false. I found as a matter of fact that no such safeguards exist. Reputable firms, out of regard for the good name of their firm, are, of course, careful what claims they make in advertisements, but this is the only safeguard that exists.

I may say at once that, in my opinion, this state of things is extremely prejudicial to the progress of therapeutics, and that it is highly desirable that the medical profession should devise some sort of organization for its own protection in this regard.

The exploitation of therapeutics by large commercial concerns really only developed in the latter half of the nineteenth century. It is true that a company was formed in Paris shortly before the Revolution for the large-scale production of the Thériac, the famous mediaeval cure-all, but this company perished in the Revolution. Modern methods of advertising have enabled the exploitation of the public on a far vaster scale than formerly; moreover, a company with extensive capital can employ more skilled assistance in conducting propaganda, and hence there is a general tendency for the cruder forms of exploitation to disappear and to be replaced by much more refined methods. The production of drugs on a large scale has, of course, brought many very important benefits to medicine, for it has rendered possible the production of drugs of uniform quality, and has been of great help in the organized search for new remedies. But although the capitalization of the drug industry has rendered important services to medicine it is idle to deny that it has also introduced serious new evils.

It was recently estimated that the capital employed in America in making secret remedies was larger than that employed in the legitimate drug trade. In England it was estimated that in 1913 more than £4,000,000 was spent on such remedies, and that the trade spent £2,000,000 in advertising. I quote these statements as evidence that there exists a very powerful and extensive trade which exploits the public; as I shall show later, there is no guarantee that this trade may not turn its attention to the medical profession if it conceives that such exploitation will yield quicker profits than exploitation of the general public. At present the medical profession has practically no organization available for its defence against such a move.

It is important to note that the law affords no protection whatever to the public or to the medical profession against any form of exploitation by proprietary medicine vendors as long as they avoid the laws against obscenity. The law on the subject was summarized in the report of the Select Committee on Patent Medicines in 1914[1] as follows:

Para. 22. "The situation, therefore, as regards the sale and advertisement of patent and proprietary medicines and articles may be summarized in one sentence as follows. For all practical purposes British law is powerless to prevent any person from procuring any drug, or making any mixture, whether potent or without any therapeutical activity whatever (so long as it does not contain a scheduled poison), advertising it in any decent terms as a cure for any disease or ailment, recommending it by bogus testimonials and the invented opinions and facsimile signatures of fictitious physicians, and selling it under any name he chooses, on the payment of a small stamp duty, for any price he can persuade a credulous public to pay."

The Committee also came to these additional conclusions:

Para. 55. "(7) That the existing law is chaotic and has proved inoperative, and that successful prosecution for fraud in the advertisement and sale of secret remedies is fraught with the gravest difficulty, though the Public Prosecutor has perhaps not sufficiently tested the powers of the existing law in respect to such cases.

"(8) That consequently the traffic in secret remedies, except as regards scheduled poisons and the grosser forms of impropriety, is practically uncontrolled in this country."

The objection will at once be raised that these paragraphs refer to the blatant frauds advertised in the lay press, frauds which the medical profession has consistently denounced, and which really are of little concern to medical men. Unfortunately it is impossible to make any easy definition which will divide these blatant frauds from proprietary medicines of highest therapeutic value. These extremes are so utterly dissimilar that it is hard to believe that there is any relation between them, but every possible intermediate grade exists, and it is a matter of utmost difficulty to establish any formula to determine which proprietary articles should be recognized by the medical profession and which should be condemned. There is in fact no definite line that can be clearly drawn between quack medicines and legitimate proprietary articles.

There are, of course, certain classes of articles that the medical profession can condemn at once.

In the first instance secret remedies require no discussion, for it is contrary to every professional tradition for a doctor to prescribe a remedy of whose composition he is ignorant. The advertisement of a secret remedy is, however, merely an indication of a lack of ingenuity and imagination on the part of the manufacturer. Nothing is simpler than to give a formula and to claim either that one of the ingredients is obtainable only by the manufacturer, or that the value of the medicine depends upon the exquisite skill with which the ingredients are prepared and compounded.

As an example of a non-secret proprietary remedy one may take the preparation sold by Mr. C. H. Stevens. Stevens first sold remedies for pulmonary tuberculosis in South Africa named "Sacco" and "Lungsava." He then came to London and claimed that his preparation was not a secret remedy in that he was willing to give the formula to any doctor who requested it. The formula was stated to be 80 grains of Umckaloabo root and 13½ grains of Chijitse to every ounce, prepared according to the *British Pharmacopoeia* methods. Careful inquiries by the British Medical Association expert in South Africa failed to show the existence of Umckaloabo or Chijitse, nor could any record of them be found in any work on pharmacy. The Select Committee on Patent Medicines examined Stevens's cure (para. 43) and the Government Chemist gave the following analysis:

	Sample First Bottle.	Sample Last Bottle.
Proof spirit	19.5 per cent.	19.5 per cent.
Solid matter	2.8 "	3.4 "
Mineral substance (ash) ...	0.2 "	0.2 "
Glycerol (approximately)...	10.7 "	17.8 "

"No alkaloids or resins were found. The solid matter corresponds with the colouring and extractive substances of an ordinary wine. The samples are therefore essentially mixtures of wine and glycerol."

Stevens brought an action against the British Medical Association for statements made regarding his remedy in *Secret Remedies*, and as the Select Committee notes, "the defendants pleaded justification, and the jury found for the defendants." In 1915 the "cure" appeared in the United States as the "U.P. Extract" exploited by the Umckaloabo Chemical Company of New York City.

During the past three years articles have appeared in the Swiss medical journals, in which Dr. Sechehaye[2,3] is reported to state that he has treated numerous cases of tuberculosis with Umckaloabo, and that it has acted as a real specific in tuberculosis. It would appear that these articles and conclusions are being broadcasted to the medical profession of this country.

I have spent so much time on this particular case because it is an example of a non-secret remedy supported by an article by a medical man published in a reputable journal. The Government Chemist's report is sufficient evidence that this is not the type of proprietary article that we would wish to see supported by the medical profession in this

country, and yet it could not be excluded either on the grounds that it was secret or that it lacked backing by a qualified medical man.

The rule that articles are to be advertised to the medical profession only is absolutely worthless as a guarantee against fraud. Advertising to the public direct is expensive, whilst advertising to or even circularizing the medical profession is relatively cheap. Hence it may pay better for a firm to confine itself to the medical profession.

The same form of advertisement will not of course appeal equally to the lay mind and the medical man, but a skilled advertiser can exploit the latter as easily as the former. This danger became acute some years ago in America. I quote some remarks by Dr. G. H. Simmons, editor of the *Journal of the American Medical Association*.[4]

"It has become a recognized fact in the patent medicine field that the easiest and cheapest way of reaching the public is through the doctor. Let me quote a paragraph that appeared in *Printer's Ink*, an advertising journal (about 1903): the words are those of a patent medicine man and they are not directed to the medical profession. 'But the patent medicine of the future is one that will be advertised only to doctors. Some of the most profitable remedies of the present time are of this class. They are called proprietary remedies. The general public never hears of them through the daily press. All their publicity is secured through the medical press, by means of the manufacturers' literature, sometimes gotten out in the form of a medical journal, and through samples to doctors. . . . The original bottle is given to the patient; he sees that the remedy does him good, and when he feels a trifle run down again he goes to a drug store and buys another bottle, not troubling the doctor. He meets a friend on the street who is not looking well. 'I know exactly how you feel,' he says. 'Now just go and buy a bottle of . . . Best thing in the world. My doctor prescribed it for me, so it isn't a patent medicine.' In this way the names of remedies advertised only to physicians get abroad to the general public. The proprietary medicine of the future, though, will be advertised through these channels. The medical papers will reap the harvest and the physician himself, always so loud in the denunciation of patent medicines, will be the most important medium of advertising at the command of the proprietary manufacturer."

Dr. Simmons concludes: "Have you ever seen an arraignment of this evil by its enemies which equals this cynical statement by its friends?"

This quotation is, I think, sufficient to show that there are no simple rules by which the medical profession can protect itself against exploitation.

There is, as I have said, a vast range of proprietary medicines varying from valuable scientific preparations, such as the best brands of organic arsenical preparations, down to the lowest form of quack frauds. The law is impotent, and medical men have got to make up their minds what they are prepared to recognize and what to reject. Huge commercial interests are involved. Obviously an unscrupulous manufacturer will consider what types of chronic diseases are particularly refractory to treatment, and choose in preference those which are painful and afflict well-to-do patients. Such diseases are, of course, the despair of the general practitioner, and he will be ready to try anything that can possibly be of benefit. In preparing the remedy the manufacturer will probably select some new scientific discovery, which is a novelty and whose powers are still undefined. It is a great advantage of course if the substance is such that there is no easy method of testing its purity or activity. The rest is easy—a commercial interest is there ready to boom the preparation and it is nobody's business to check the statements made.

Obviously the general practitioner—who is not an analytical chemist, nor an experimental pharmacologist, nor a secret inquiry agent—has no means of testing the inherent probability of a new remedy. On the other hand the exploiters of a new remedy have the power of money behind them to promote the sales and profits.

As regards the attitude of medical men to doubtful proprietary remedies the following extracts from the Select Committee on Patent Medicines are of interest:

Para. 29. "With regard to advertisements in the medical press, we consider that adequate censorship has not in all cases been exercised, as indeed was admitted by Dr. Cox, the representative of the British Medical Association, and instances to this effect will be found in the evidence we received.

Para. 47. ". . . We have learned . . . to our great surprise that persons of influential social positions and small means will sell the use of their names to advertise secret remedies; that large sums of money are expended in canvassing medical men; that many medical men give testimonials (with the use of their medical qualifications, but without the use of their names) to proprietary and secret remedies, and allow themselves to be made, as a medical man declared in a public address, 'the catspaw and fool of the fraternity of the secret remedy'; and that there are medical men who prescribe to their patients remedies of this class of whose composition they are themselves largely ignorant. We had evidence in two cases of medical men acting as directors of companies manufacturing secret remedies."

The evil of proprietary medicines developed perhaps to a greater extent in America than in this country. The evil first became obvious about 1879, and early in this century the position was defined as follows by Dr. Simmons:

"Conditions in this regard had become so disgraceful . . . that there seemed to be no statement too silly, no claim too extravagant and no falsehood too brazen for use by those who wrote the advertising literature that physicians are asked to read and believe. . . . In brief this business, the annual profits of which run into millions, has grown until the use of proprietary medicines by many physicians has almost displaced the use of the individual official drug. It has checked advance in scientific methods of treatment, inhibited intelligent clinical observation and developed an optimism that is unwarranted by facts, an optimism that is more fatal than the most radical therapeutic nihilism. But above and worse than all, this commercialized materia medica has blighted our literature by debauching our medical journals and even by tainting our textbooks."

These are strong words and picture an evil somewhat worse than any that we have in this country to-day. The evil produced, however, a reaction in America, and steps were taken to check it, whereas in our country it still flourishes unchecked.

The American Medical Association in 1905 appointed a council on pharmacy and chemistry composed of leading chemists, pharmacologists, and clinicians. These examined all proprietary remedies and published a list and description of all such remedies as conformed to certain simple rules. This list is published annually under the title of *New and Non-official Remedies*, while rejected substances are dealt with in other volumes.[5]

The rules of the Association were roughly as follows:

The drug must not be of secret composition, must not be advertised directly to the public, and must not be advertised indirectly to the public by means of literature sent with the bottle stating the disease it is intended to cure; the name must not suggest therapeutic claims, no unwarranted, exaggerated, or misleading statements as to the therapeutic value must be made, and no article is accepted which is useless on account of its unscientific composition. Of these rules the last two are obviously largely matters of opinion, but are perhaps the most important of all.

The American medical practitioner, therefore, who is deluded by specious advertisements into recommending some useless nostrum has only himself to blame, since he is acting against the considered advice of a body of expert opinion.

In other countries also an attempt has been made to set up some machinery to judge the claims of advertisement of proprietary articles. The *Medical Journal of Australia*,[6] for example, has arranged to conduct analyses of Australian proprietary products submitted for advertisement. In Holland the Rijks-Instituut voor Pharmaco-therapeutisch Onderzoek has conducted a series of analyses on patent and proprietary preparations.[7] In the case of the latter combined chemical, pharmacological, and clinical tests have been undertaken, providing very valuable information. In this country valuable work has been done by the *Lancet* in publishing chemical analyses of proprietary preparations.

Over ten years ago the British Medical Association did a particularly valuable public service in publishing the two excellent volumes *Secret Remedies: what they cost and what they contain*. The British Medical Association, moreover, has passed a series of resolutions regarding preparations which it is prepared to accept for advertisement. The most important regulations exclude advertisements containing any demonstrated false statement, and preparations the principal ingredients of which are not disclosed to the profession, and preparations which are advertised elsewhere in a misleading or objectionable manner.

The BRITISH MEDICAL JOURNAL, the organ of the Association, finds it necessary, however, to print below its index to advertisements the statement, "It must be understood that the acceptance by the British Medical Association of an advertisement does not imply a recommendation and that no responsibility is accepted with regard to the accuracy of the statements therein contained."[8] The

measures which have been taken in England are of value, but I think that it is clear from what I have said that nothing short of an organization conducting extensive chemical and pharmacological tests, and in certain cases even clinical tests, is sufficient to give reliable information on the really important point—namely, whether the therapeutic claims made for a proprietary remedy are based on reasonably satisfactory evidence.

American experience has demonstrated that it is possible to provide such a source of information, and that it is of great service to the medical profession, but it has also shown that the work is difficult and expensive, and that if effective it is certain to arouse furious opposition from the vested interests it injures.

The object of my paper is to convince the Section of the desirability—nay, even the necessity—of having some organization in this country to perform a similar work.

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England and Wales.

Tuberculosis in Lancashire.

The report for 1922 by Dr. G. Lissant Cox, central tuberculosis officer for Lancashire, has some interesting features. In a chapter on the distribution of pulmonary tuberculosis in Lancashire in different localities and in different industries, it is demonstrated that there is a marked difference between the spinning and the weaving districts of the county. Pulmonary tuberculosis is much more prevalent in the male population of the former (the Oldham district) than in the latter (Blackburn and Burnley). Between Blackburn and Burnley themselves there is also a considerable difference, both the male and the female population of Blackburn being remarkably immune, though even Burnley has rates appreciably below those for the whole of the administrative county. The explanation suggested for the difference is that in the Burnley district the number of men employed in mining and quarrying (4,836) is three times as many as in the Blackburn district, while, if the comparison be confined to the two county boroughs, the difference is fully nine to one. In the predominantly rural areas of Lancashire the rate is 36 per cent. below the county average. If house accommodation be taken as the criterion it is found that, as was to be expected, overcrowding, as amongst the St. Helens glass workers, the central Lancashire coal miners, and the Widnes chemical workers, is accompanied by a heavier tuberculosis mortality than where living conditions are better. Another tuberculosis problem dealt with relates to contacts. Of 1,626 "house contacts" examined, 79 were diagnosed as definitely tuberculous, 57 of them being pulmonary cases and 22 non-pulmonary; evidence for the correctness of the diagnosis is submitted in the report. Where the patients with whom the contacts lived were "open" cases many early or unsuspected cases were discovered, but including all classes of patients the infection of contacts was at the high rate of 48.6 per 1,000.

Dr. Lissant Cox reports on a third question of constant interest—the value of sanatorium as compared with home treatment. After certain necessary explanations of his classification, he goes on to analyse 3,948 histories of adults who began treatment during the five years 1914-18, the conditions being stated as at the end of 1922. Of 981 sanatorium cases and 728 non-sanatorium cases in the early and intermediate stages with negative or absent sputum, 16 per cent. of the former and 42.6 per cent. of the latter had died. Next, as to cases of positive sputum, of 1,286 sanatorium patients 66.2 per cent. were dead by the end of 1922, and of 953 non-sanatorium cases 84.8 per cent. It is pointed out that both for sanatorium and home cases early diagnosis is very important, and that absent or negative sputum means longer capacity for work and better chance of survival. Cases with positive sputum in the age period 15-25 years have a higher mortality than any others. There has been an improvement in respect of notification. In 1918, 18 per cent. of the fatal cases were not notified during life; in 1919, 16 per cent.; in 1920, 13 per cent.; in 1921, 10 per cent.; and in 1922, 8 per cent. But surely a lower rate still can be achieved, even though the 8 per cent. is much better than in various other places, where omissions range from 12 to 41 per cent.

Health of Liverpool.

The city of Liverpool covers an area of 33 square miles, and at the middle of 1922 the population was estimated at 823,095. The birth rate during 1922 was 26.1 per 1,000, the death rate from all causes 14.6 per 1,000, and infant mortality rate 14.3 per 1,000 births. The birth rate in the Woolton district, where there is a population of about 10,000, was as low as 15.8 per 1,000, but in the Scotland district, with a population of 46,000, it was 37.2. The death rate in these two districts was respectively 9.8 and 19.9 per 1,000, and in the Exchange district, with a population of 36,000, it was as high as 23 per 1,000. There is a like disparity as regards the infant mortality. In Woolton this rate was equal to 53 per 1,000 births, in the Scotland district 120, and in Exchange 133 per 1,000. In the preface to his report Dr. E. W. Hope expresses the opinion that the infant mortality rate is always the index of the sanitary condition of an area. There would appear, therefore, to be plenty of work still to be done by the sanitary authority in the worst parts of Liverpool. Few if any local authorities have paid more sustained attention to the housing of the working classes than the Corporation of Liverpool. During the past three years it has erected over 5,000 houses, and 500 bungalows have been converted from army huts; but there are still several thousand applications for houses from persons housed under bad conditions but who are well able to pay reasonable rents for accommodation if it could be found. Referring to those families who live in one room Dr. Hope considers that such conditions are gravely prejudicial to the public health and welfare of the city. There is, he says, an increased demand upon the hospitals for treatment of minor ailments which under ordinary conditions could be dealt with at home, and requests for admission to maternity hospitals or homes increase for the same reason. The risk of the spread of tuberculosis is accentuated, and many instances occur in which persons, after leaving a sanatorium, quickly relapse into their former condition on returning to their overcrowded rooms.

The great increase during recent years in the population of many large towns contiguous to each other has led to difficulties in administration and in some cases to avoidable expenditure. Within the past two years an attempt has been made by the Merseyside county boroughs of Liverpool, Bootle, Birkenhead, and Wallasey to overcome these difficulties by some scheme of co-operation. Pending general agreement on a large scale by the councils concerned the medical officers of health have agreed that in the event of any disease scheduled under international agreement arising in any part of the area of their administration, the fact should be forthwith reported to the port medical officer for communication to the consular body or bodies. It was also agreed that in the event of such outbreak assuming grave proportions the medical officer of health of the area in which the case arose should on request be entitled to assistance from the staff of any other of the riparian authorities.

The conditions under which animals are slaughtered in Liverpool are anything but satisfactory. The 17 private slaughterhouses are said to be well conducted and kept in good condition, but many of them are situated in cramped and congested positions, and are not suitable for the purpose to which they are put. The central abattoir, which covers an area of seven and a half acres, is in such an unsuitable position and the buildings are so congested that Dr. Hope strongly urges the erection of a modern abattoir and meat market in keeping with other branches of public health work in the city. He compares by means of excellent photographic illustrations the modern slaughterhouse in Edinburgh with the Liverpool buildings. If the Liverpool

corporation is to maintain its reputation as a progressive health authority it cannot afford to ignore the well timed advice of the medical officer of health.

MANCHESTER AND SALFORD HOSPITALS SHILLING FUND.

The Duke and Duchess of York recently visited Manchester to receive a cheque representing the total amount subscribed to the Lord Mayor's Shilling Hospital Fund. When Councillor Cundiff took office as Lord Mayor he had a return made from thirteen Manchester and Salford hospitals and found that their finances were in a very serious condition. He opened a shilling fund hoping to get two million shillings, and, organized by Mr. Mathewson Watson, £73,000, or 1,466,000 shillings, had been subscribed by three-quarters of a million subscribers. The amount was the largest ever raised for a charity in Manchester, and the sum was sufficient to liquidate all the debts of the Manchester and Salford hospitals.

MEDICAL MAYORS.

The following are among the medical men elected mayors on November 9th: Alderman Dr. W. J. Caie (Bury St. Edmunds), Dr. H. J. Campbell (Dartmouth), Dr. J. W. Clegg (Burnley) re-elected, Dr. W. I. Fern (Congleton), Dr. O. Wynne Griffith (Pwllheli), Dr. H. Jackson (Wandsworth) re-elected, Dr. W. G. Mortimer (South Molton), Dr. J. T. T. Ramsay, J.P. (Blackburn), re-elected, Dr. J. Rodley (Rochdale), Dr. T. B. Scott (Bournemouth), Dr. J. R. Staddon (Ipswich), Dr. Robert Turner (Bootle).

Scotland.

EDINBURGH ROYAL INFIRMARY WAITING LIST.

AT a recent meeting of the managers of Edinburgh Royal Infirmary it was reported that 1,765 cases were awaiting admission to the institution at November 1st. This is said to be the largest number ever recorded, and means virtually that two patients were waiting for the evacuation of each occupied bed. The statements about waiting lists at general hospitals, when made in the usual form, are somewhat misleading. A patient whose admission is not a matter of urgency must frequently in a busy general hospital wait for a few days, or it may be a week or two, before place can be found for him in the wards. Yet the protracted retention of names on a waiting list for several weeks or months is often merely a convenient method, not admitting of argument, of expressing the opinion that the cases in question are unsuitable for treatment in the wards. When all allowance is made, however, it cannot be doubted that in the case of hospitals where large waiting lists are a constant feature it is likely that a certain proportion of the patients would be benefited by speedier admission, and that some may be adversely affected by prolonged delay. Much might be done both in the direction of reducing the numbers of waiting patients and of accelerating the departure of milder cases under treatment in hospital by the appointment of almoners or similar officials to investigate the circumstances of those who enjoy the benefits of the large hospitals.

DEAN INGE IN EDINBURGH.

Lord Sands was in the chair at the inaugural address for the session of the Philosophical Institution of Edinburgh delivered in the United Free Church Assembly Hall, Edinburgh, on November 8th, by the Dean of St. Paul's, who spoke on national decay and regeneration. Dr. Inge said that in spite of all that historians had written the problem of the fate of nations remained very obscure. Civilization brought with it an arrest in human evolution. In the early stages of civilization, what might be called barbarism or the higher savagery, a considerable selection in favour of higher types had usually taken place. Until quite recent times the most vigorous and successful classes probably supplied more than their share of the next generation. There had always been in England a large class of submen, beggars, and wastrels, but the enormous death rate of the towns kept them down and they were not subsidized and encouraged to multiply as they were to-day. The most important fact of the nineteenth century had been the prodigious increase of wealth and of population. Natural selection had been almost entirely suspended, and a population grew up with no traditions, social or religious. This was a totally new phenomenon in history. One kind of natural selection was favoured by modern life—that against disease. The modern man might be physically a poor creature, but he had developed a new power of resisting microbes. Non-microbic diseases had increased, since people must die of something. Thus cancer had trebled and diabetes had doubled the number of their victims. The expectation of life after 55 or 60 was stationary, though the general death rate was little more than half what it was sixty years ago. This was partly due to sanitation and medical skill, but partly also to increased adaptation to town life. It had created the menacing problem of overpopulation, with a million unemployed to feed out of the taxes. The decline in the birth rate from 36 in 1878 to 20 in 1922 had prevented a social revolution and the death of many millions by famine, but it was in itself dangerous because it was steadily impairing the quality of the people who were breeding from the bottom and dying off at the top. It was a bad symptom that the lowest birth rates were those of doctors, ministers of religion, and teachers. There would be less ground for alarm if the skilled workman was filling the cradle, but it was the slum dweller, the subman, and the untaxed dole-receiver who was the father of the next generation. The highest birth rate of all was that of the feeble-minded. The only healthy class which had a high birth rate was that of the miners. In indicating tendencies to regeneration the lecturer expressed the view that the antisocial attitude of the labour organizations was not likely to be permanent. As this class came to exercise more power it would develop more sense of responsibility. The orgy of wastefulness which at present crippled the national resources was the natural result of a system under which one class levied the taxes and another paid them. When the masses realized that it was not to their interest to fill the island with degenerates and unemployables there might be a great change in public policy. There was no reason in the nature of things why the working population should be revolutionaries or enemies of science, nor was there any reason why science and idealism should dislike and distrust each other.

Ireland.

QUEEN'S UNIVERSITY CLUB, LONDON.

A LARGE informal meeting of students and graduates of the Queen's College and Queen's University, Belfast, was held at the Hotel Belgravia, Victoria, S.W., on Thursday, October 18th. It was unanimously decided that a Queen's University Club, London, be formed, and a committee was appointed to draw up rules and to arrange for another meeting at as early a date as possible. The first annual dinner dance of the club, which is being preceded by a short business meeting of members, will be held at the Criterion Restaurant on Thursday, December 13th. Graduates and former students wishing to become members or to receive invitations are requested to communicate with the honorary treasurer, Mr. R. A. Kerr, 17, Wimpole Street, W., or the honorary secretary, Mr. W. McK. H. McCullagh, 152, Harley Street, W.

DEATH OF DR. WALLACE BEATTY.

We regret to announce the death of Dr. Wallace Beatty, which occurred on November 8th at his residence, 38, Merrion Square, Dublin, after a very brief illness. Only a few days earlier he was engaged in his medical duties; a heart attack, complicated by influenza, was the immediate cause of death. He was one of the leading members of the profession in Ireland, a most painstaking and skilful practitioner, and one of the most lovable of men. As chief physician of the Adelaide Hospital, where he succeeded the late Dr. Little, he enjoyed the respect and esteem of the medical and nursing staffs and of his patients. Dr. Beatty was born in 1853. He received his earlier education at the

Royal School, Dungannon; in 1872, when he entered Trinity College, Dublin, he obtained the second place. His college career was brilliant; he obtained a Royal Scholarship in 1872, a Classical Scholarship in 1875, and a Medical Scholarship in 1877. His professional education was conducted in the School of Physic, and the Adelaide, Rotunda, and St. Mark's Hospitals. In 1876 he graduated B.A., in 1879 M.B. and B.Ch. In 1885 he obtained the Licence of the College of Physicians, in 1886 the Membership, and in 1887 the Fellowship. He was house-surgeon to St. Mark's Hospital, medical officer to the Dublin Throat and Ear Hospital, and demonstrator of anatomy in the Carmichael College, in which he was later lecturer on pathology and medicine. In addition to his other appointments he was honorary professor of dermatology in Trinity College. Dr. Beatty was the author of several papers which he read before the Royal Academy of Medicine. These dealt with the pathology of lead poisoning, the action of mercury in diseases of the heart, and with other subjects of purely medical interest. Quite recently he published a valuable work on skin diseases. Dr. Beatty married, in 1888, a daughter of Dr. Samuel Edge, of Granstown House, Queen's County. Of this marriage there were five sons. One, Eric, served in the Royal Dublin Fusiliers, and was killed in the war. Two other sons also served in the war—one in the Royal Dublin Fusiliers and the other in the Artillery. Another son entered the Indian Civil Service.

Administration of the Medical Charities Acts in County Mayo.

A subcommittee of the Castlebar District Council, appointed to consider the changes made by the Local Government Department with regard to the administration of the Medical Charities Acts on a county basis, has made a report from which the following are extracts:

We are of opinion that medical charities services should be administered by the Rural District Council, and all the appointments thereunder made by the District Council, subject to the approval of the County Board of health. In like manner outdoor relief should be administered by the Rural District Council, and the funds for these two services should be, as heretofore, a union charge, and estimated and provided for by the Rural District Council. The making of these charges county-at-large charges is not a step, in our opinion, calculated to guarantee economy, and the administration of these services by local councillors, conversant with all the local circumstances, is a guarantee that there will be proper supervision and careful spending of the rates collected from the people of the district concerned. As regards boarded-out and hired-out children's services, we also think these services should be placed with the Rural District Council. During the period the above three services—Medical Charities, Outdoor Relief, and Boarded-out and Hired-out Children—were temporarily discharged by the District Council on the abolition of the Castlebar Board of Guardians, matters were conducted with efficiency and economy, resulting in general satisfaction to the ratepaying public.

Correspondence.

ANTE-PARTUM HAEMORRHAGE AND ECLAMPSIA.

SIR,—The letters of Dr. Johnstone (October 27th, p. 784) and of Dr. Paramore (November 10th, p. 900) raise some points of interest. As Dr. Johnstone points out, the association of eclampsia with placenta praevia, if established, supports the views on this toxaemia which I advanced in 1914. In 1921 Miller and I published a series of cases exhibiting this association, and Miller has since collated 49 cases of placenta praevia with albuminuria in 37 per cent. and eclampsia in 3. The evidence is therefore strong.

Placenta praevia is thus brought into line with the placental separation of accidental haemorrhage in which toxaemia is common. The evidence of placenta praevia, moreover, throws on the problem a clearer light than has hitherto been available, for here the detachment of the placenta, to which the toxaemia is intimately related, is patently mechanical in origin and is, in point of fact, usually due to the tearing away of the placenta from its moorings by the stretching incidental to normal labour.

Where the *normally* situated placenta is detached the toxaemia is invariably intense and often eclamptic if the placenta is retained in the womb for some time (concealed accidental haemorrhage), whereas if the detachment is followed quickly by extrusion toxaemia is slight or absent. Dr. Miller has noted the same striking facts in placenta praevia, and in Dr. Bradshaw's record, which originated this correspondence, the same sequence is present.

The body of facts can, I believe, be adequately explained only on the view that the poisons are generated rapidly in the devitalized and disintegrating placenta and gain an immediate and easy entrance to the maternal system via the circulation of the adjacent healthy organ.

Dr. Paramore challenges this view in his interesting letter with arguments to one or two of which alone space will permit me to reply. While recognizing the importance of the severity of the toxaemia in concealed accidental haemorrhage, he thinks that the distension of the womb by the accumulating blood causes toxaemia by pressing on the kidneys and other abdominal organs. This view is disproved by the fact that there may be intense toxaemia where the concealed clot is no bigger than an apple, apart from the fact that the acute and often extreme distensions of general medical and surgical practice are never associated with eclampsia. Even if such an explanation were available in accidental haemorrhage it is surely inapplicable to placenta praevia. Here Dr. Paramore imperfectly shelters his prejudice under the statements that "it is not surprising that a multiparous woman with a placenta praevia should come to pass albumin in her urine; multiparous women are usually older than primigravidae and their kidneys cannot be expected to be as sound." The scientific insufficiency of this evidence is apparent.

If anything is clear it is that in the eclampsia both of accidental haemorrhage and of placenta praevia there must be some common factor. There is such an obvious common factor in a mass of devitalized placenta disintegrating in the womb.

If it is established that in placenta praevia the sequence is mechanical separation, then disintegration of the placenta, then eclampsia, the argument which led me to trace the same sequence in accidental haemorrhage gathers added volume. Albuminuria and eclampsia are, I believe, the disease of pregnancy because the large placental organ, dependent as it is on a rapidly improvised and vulnerable blood supply, is peculiarly exposed to damage and death by factors that may be purely mechanical in nature. What these factors are in the ordinary case is still matter for conjecture. That they undoubtedly operate by causing placental death is proved by finding that in a case of eclampsia (and the same applies to accidental haemorrhage and placenta praevia), where a sufficient time elapses before labour, massive necrosis is invariably present. Where early labour takes place this necrosis is not recognizable. These findings point to the view that the poisons are produced during the early disintegration of the dying organ.

I have elsewhere shown that in accidental haemorrhage there may be indisputable evidence of venous blockage. In one such case that died of eclampsia the uterine wall supplied by the ovarian vessels on one side was in a state of acute strangulation. In the placenta the changes characteristic of necrosis were found involving nearly half the organ where it had been uplifted by the retroplacental clot.—I am, etc.,

Edinburgh, Nov. 11th. JAMES YOUNG.

CARBON MONOXIDE A PREDISPOSING CAUSE OF PULMONARY TUBERCULOSIS.

SIR,—Dr. Hazleton's article (October 27th, p. 763) is of much interest to me because, as a member of the Macclesfield Town Council, I have been endeavouring recently to draw the attention of our local authority to the danger to public health of gas leakages, especially where the monoxide content is high. In this town the percentage is 18. I am informed that in some places it is more—for example, 22 per cent. in Oldham. Macclesfield is an old town, and I am well familiar with the circumstance that faulty fittings and escapes from small pipes, and even from mains, are not unknown.

I placed much medical evidence before the public, both in and outside the council, feeling impelled to do this by the fact that I have had three cases in my practice this year

which appeared to me to be examples of slight monoxide poisoning.

The chief result of my remarks was a somewhat strongly worded article in the *Gas Journal* of August 22nd, 1923, which used no argument, but honoured me by devoting a column and a half explaining to its readers that I really knew nothing of the subject, the headline being "The Laird and the carbon monoxide bee."

I was well on the way to arousing local public attention to the desirability of having as small a monoxide percentage as possible in our town's supply when I was faced with a statement from Dr. Leonard Hill, which apparently had been procured specially to meet my criticisms, to the effect that "the belief that health can be damaged by the continued inhalation of very small leaks of coal gas is, then, wholly an unfounded one."

As this statement seems quite a reversal of the ideas of Dr. Hazleton and many others, I think it would be in the public interest if steps were taken to issue an authoritative statement as to whether continued inhalation of minute quantities of coal gas is hurtful to the human organism or not, taking into account the length of time of inhalation and the percentage of CO in the gas. I should also like to know if CO is a cumulative poison or not. I was taught when a student that it was, but Dr. Leonard Hill seems to cast doubt on this point.—I am, etc.,

John N. Laird, M.A., M.D., D.P.H.

Macclesfield, Nov. 11th.

LABYRINTH DEAFNESS.

Sir,—In the British Medical Journal of November 10th (p. 867) Dr. Dan McKenzie, discussing the presence of the signs of nerve deafness in cases where only simple lesions of the conducting apparatus are to be found, says:

> "As to the manner in which simple lesions of the conducting apparatus unaccompanied by cochlear changes may induce the phenomena we usually associate, and with reason, with cochlear and other diseases I am ignorant. Here we come upon one of the gaps in our knowledge."

As this is a gap which I believe I am able to fill I feel justified in asking you to insert a brief account of my own explanation of this problem, which I have now been investigating for many years, and have not hitherto published.

Any irritation, overstimulation, or infection produces an immediate vascular congestion of the middle ear. A familiar example is the intense flushing of the tympanic membrane after syringing. Considering the vascular supply of the ear, it is obvious that any dilatation of its blood vessels cannot be confined to those of the conducting apparatus alone. The blood vessels of the labyrinth must also dilate. The perilymph in the bony labyrinth communicates with the cerebro-spinal fluid in the subarachnoid space by means of the aqueduct of the cochlea. Through this aqueduct runs also a small blood vessel. The calibre of the aqueduct differs within wide limits in different individuals. In some it is a mere capillary tube. Any dilatation, therefore, of the vein which passes through it will tend to narrow the passage available for the flow of perilymph, and in individuals in whom the tube is of capillary size will entirely occlude it, thus producing a glaucoma of the labyrinth with its accompanying tuning-fork signs of labyrinthine deafness, though the lesion is entirely confined to the conducting apparatus. The endolymph in the membranous labyrinth is affected in exactly the same way as the perilymph in the bony labyrinth, for the aqueduct of the vestibule through which the minute ductus endolymphaticus enters the cranial cavity to end in the sacculus endolymphaticus is also traversed by a blood vessel, which by its dilatation shuts off the membranous labyrinth from its minute safety valve, the afore mentioned sacculus endolymphaticus. The facts explain the occurrence of labyrinthine signs in some cases of middle-ear deafness and not in others. The patient with a large size perilymph exit from the bony labyrinth does not suffer its occlusion by the vascular congestion which accompanies middle-ear disease, and therefore presents no signs of nerve deafness if his conducting apparatus is alone at fault.—I am, etc.,

F. Pearce Sturm, Ch.M.

Ear and Throat Clinic, Leigh, Lancashire, Nov. 10th.

VACCINATION PROPAGANDA.

Sir,—I am indebted to you for pointing out (November 3rd, p. 826) that the 165 deaths from vaccination during the period 1906-20, referred to in my article (British Medical Journal, September 29th) include deaths from sepsis or erysipelas following vaccination, and I regret that inadvertently I gave the opposite impression.

The Registrar-General's present practice, as explained by you, of classifying deaths from sepsis or erysipelas following vaccination (and presumably arising as the indirect result of vaccination) under the head of those diseases instead of, as formerly, under the head of "Other effects of vaccination," is, in my opinion, to be regretted. It may be more "consistent," but it is certainly open to the serious objection that it rather tends to obscure the real loss of life due to vaccination, in spite of the fact that in the text, in a separate volume, the other deaths are mentioned. It is common knowledge that the majority of the deaths due to vaccination result from some form of superadded bacterial infection which has gained access to the system through the vaccination wound, either at the time of the operation or subsequently, rather than from simple vaccinia. And, after all, the consideration which should weigh with us in considering the arguments for and against infant vaccination, and the one which certainly weighs with the bereaved parents, is, "Would this child have contracted erysipelas, septic poisoning, etc., from which it died, if it had never been vaccinated?"

You next criticize my statement that "we" (implying the medical profession) "opposed the conscience clause for all we were worth." I admit that I ought to have made it clear that I included under the term "conscience clause" the clause as modified by the Act of 1907. But I think that a majority of the medical profession were strongly opposed even to the original conscience clause, and honestly believed that it was a retrograde and dangerous step. Subject to the qualification I have mentioned my statement that a serious decrease in vaccination followed is, of course, correct. Lastly, you say:

> "Most fortunately for the public welfare the type of small-pox in this country has commonly in recent years been mild. This has done much to avert the punishment which would have followed the neglect of vaccination had the European variety of the disease continued to prevail."

I wish to suggest that the fact that the severe (European or Asiatic) variety of small-pox (and it was against this type that compulsory infant vaccination was originally enacted) has not continued to prevail *is no mere accident*, but that it is the result of the greatly improved preventive measures which are now so actively adopted whenever the disease breaks out, and in spite of the neglect of infant vaccination. Again and again during the past nineteen years has the severe type of the disease been introduced into this country, often under circumstances, such as failure to recognize the first cases, which seemed highly conducive to its spread. The outbreaks in the East End of London, notably in Mile End in 1911 and in Poplar and Stepney last year, are instances in point. Yet the disease has practically always been stamped out without its attaining serious epidemic proportions. In his last annual report for the County of London Sir William Hamer draws a contrast between the experience of London last year and the experience in 1901. He writes:

> "In 1901 . . . the defence was not sufficiently strong and the disease gained foothold and spread with rapidity. During that and the following year nearly 10,000 cases occurred. . . . It is useful here to note the defects of organization against small-pox which permitted the disease to penetrate London during 1901. These defects centred mainly round one factor, namely, the extreme difficulty which had been felt in identifying many cases of the disease. . . . In consequence many cases, highly infectious, remained unisolated and at large among the population. . . . The counter attack against small-pox was, therefore, paralysed by the delay in arriving at a diagnosis. . . . That was what happened again and again, and this led, in 1901-3, to the loss of 1,600 lives and an incalculable expenditure of money. [It will be noted that Sir William Hamer makes no suggestion that it was neglect of infant vaccination which caused the epidemic.] Happily the mischief brought its own remedy. The late Dr. T. F. Ricketts after ten years' research formulated a method for recognizing small-pox promptly and accurately. . . . Since 1901 there have been a few restricted outbreaks . . . any of which might easily have developed into a repetition of the events of 1901 but for improved organization and more efficient administration."

There is only one consideration that I wish Sir William had added to his excellent summing up of the situation, and that is this: in almost every instance, where we are dealing with the severe (Asiatic) type of the disease, the cases which are overlooked, and which cause the trouble he refers to, will be found to be mild modified cases in once-vaccinated subjects whose vaccination has "lapsed." Had these cases been unvaccinated the attack would have been much more severe and their nature much more obvious, and almost certainly they would not have been overlooked. I am convinced that sufficient importance has not hitherto been attached to this consideration. I agree with Hewlett and Nankivell when they say:

"Given that the staff of the health department is sufficient and that the provision of hospitals . . . is adequate, the control of small-pox is more easy among a population that is entirely unvaccinated than among one that is partially and insufficiently vaccinated."—*Principles of Preventive Medicine*, p. 306.

They go on to recommend universal revaccination as the ideal, but if we cannot have universal revaccination it looks as if our present system was worse than useless!

It is not surprising that the present ultra-mild American type of small-pox is proving so difficult to deal with in view of the ease with which the disease is overlooked. Fortunately, however, the mildness appears to be inherent and breeds true, so little injury to health is caused. Indeed, it is very possible that we shall come to regard it as a "para"-small-pox. But if this is so we are clearly not justified in using the horrors of the old severe Asiatic type of small-pox as an argument for insisting upon the necessity for universal infant vaccination as a protection against the new ultra-mild American small-pox.—I am, etc.,

Leicester, Nov. 6th. C. KILLICK MILLARD.

⁂ We refer elsewhere to Dr. Millard's letter.

ATTITUDE IN CATHETERIZATION OF THE BLADDER.

SIR,—Why is it so easy for a bladder to get infected from catheterization of a patient in bed in spite of most scrupulous aseptic and antiseptic precautions, and yet one so often meets or hears of patients who have been in the habit of passing a catheter on themselves for many years without any precautions as to asepsis or antisepsis and without any marked signs of cystitis?

May it not be due to drainage of the bladder, in the latter case from its most dependent part, and in the former case from a point which is not its lowest part? Most patients who pass the catheter for themselves do so either standing or sitting up; but they are in the prone position when the catheter is passed on them.—I am, etc.,

October 25th. H. E. BAMBER.

ASTHMA DUE TO INSECT POWDER.

SIR,—The answers to the two questions asked by Dr. Coke (November 3rd, p. 841) are as follows: (1) The patient's sensitiveness to dog hair was not tested, since she had frequently been closely associated with dogs, but asthma had only resulted from a combination of dogs and insect powder. (2) The powder was tested on a normal arm with a completely negative result.—We are, etc.,

J. R. GARRATT,
Dublin, Nov. 10th. JOSEPH W. BIGGER.

BUTYN AS A LOCAL ANAESTHETIC.

SIR,—As an addendum to Dr. William Hill's notes on butyn (November 10th, p. 876) it should be stated that this substance cannot be used exactly as cocaine. Quite a small quantity of the solid laid on a sty produced white sloughing of the conjunctival surface, and violent chemosis followed, although it was washed off in a few seconds. Considerable care should therefore be exercised in the use of the stronger solutions, and the solid regarded as a possible escharotic for mucous surfaces, causing violent inflammation in some cases.—I am, etc.,

London, W., Nov. 10th. JAMES KERR.

SIR,—The article by Dr. William Hill (November 10th, p. 876) coincides in every way with my experience of butyn. I was unable to procure, in time, a supply of the anaesthetic to do justice to the preparation, so withheld the answer to the inquiry of the Cocaine Substitutes Committee of the Ministry of Health.

On a series of minor operations on the nose and throat I have found butyn inferior to cocaine; striking examples being on the same patients in whom both sides of the nose required interference to practically equal degrees, using on one side cocaine, and on the other butyn 5 per cent. The comparative comfort and discomfort in certain cases was very evident, the patients in these cases volunteering the statement that in one case the discomfort was much greater. Of course, the anaesthetic used was not divulged to the patient.

In eye operations butyn is very satisfactory as an anaesthetic, but there are two disadvantages: excessive smarting on first application, and hyperaemia of the conjunctiva, especially in certain individuals. I hold that cocaine is still dominant in eye, throat, and nose operations.—I am, etc.,

ARNOLD FERGUSON, F.R.C.S.Ed.,
Surgeon to Diseases of the Eye, Throat, Nose, and
November 10th. Ear to the Jersey General Hospital.

PAY OF MARRIED I.M.S. OFFICERS.

SIR,—I have read with interest recent letters from officers of the R.A.M.C., and venture to make similar remarks regarding the pay and allowances of married officers of the sister service to which I belong.

Married officers in the Indian Medical Service, in common with all married officers in other branches of the service in India, receive no married allowances, but identically the same pay and allowances as unmarried officers. Their expenses are not less than double, and in the case of married officers with families more than treble, those of unmarried officers. They are obliged to keep up two establishments for six months in every year when their wives and families are forced to go to the hills on account of the prejudicial effect of the climate in the plains during the hot weather. The move to the hills and back is alone sufficient to cause great anxiety; the rents of houses are exorbitant, food and necessaries excessive in price, and servants demand enormous wages. All this is well known to the Government of India, which has, up to the present, done nothing to alleviate the sufferings of married officers.

India is becoming day by day a country in which a married European officer cannot hope to live with any self-respect, as he is expected to give the best years of his life towards serving a Government which will not realize that he must necessarily be in a constant state of anxiety regarding the present and the future of his family and himself.—I am, etc.,

October 24th. MAJOR I.M.S. (MARRIED).

Universities and Colleges.

UNIVERSITY OF CAMBRIDGE.

AT a congregation held on November 9th the following medical degrees were conferred:

M.B., B.CH.—L. B. Hartley, R. C. Hewitt.
B.CH.—T. M. Thomas (admitted by proxy).

UNIVERSITY OF LONDON.

AT a meeting of the Senate held on October 24th Mr. Geoffrey E. Duveen's offer of £10,000 for the establishment of a University lectureship in otology was accepted and the thanks of the Senate were accorded to the donor for his generous gift. It was reported that Mr. Duveen had suggested that the first holder of the lectureship should be Mr. Richard Lake, F.R.C.S., surgeon to the ear, nose, and throat department of University College Hospital.

The Academic Council reported that Professor F. Wood Jones had intimated his inability to accept the University professorship of anatomy, tenable at St. Bartholomew's Hospital, to which he was appointed in May last.

It was decided that for the second examination for medical degrees, Part I, in March, 1924, the syllabus in force in 1913 be adopted; and that in and after 1924 the M.B., B.S. examination for internal and external students be held in November-December instead of October.

Mr. H. J. Waring has been elected chairman for 1923-24 of the Brown Animal Sanatory Institution Committee.

The University medal in Branch III (psychological medicine) of the M.D. examination for internal and external students, July, 1923, has been awarded to P. C. P. Cloake (London Hospital), and in Branch IV (midwifery and diseases of women) to P. J. Veale (University College Hospital).

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

At the annual meeting of the Royal Faculty of Physicians and Surgeons of Glasgow held on November 5th the following office-bearers were elected:—President: Dr. T. K. Munro. Visitor: Mr. J. H. Pringle. Treasurer: Mr. J. H. MacDonald. Honorary Librarian: Dr. E. H. L. Oliphant.

The following, after examination, have been admitted as Fellows: G. F. Andeen, P. C. Banerjee, John Hare.

Obituary.

THOMAS PRIDGIN TEALE, M.B., F.R.C.S., F.R.S.,

Consulting Surgeon, Leeds General Infirmary.

We have to record with deep regret the death of Mr. Thomas Pridgin Teale of Leeds, on November 13th, at the age of 92. He was a link with the past, for he had been Sir William Bowman's assistant during the Crimean war, and was the oldest Fellow of the Royal College of Surgeons of England, having obtained that diploma in May, 1857. He lived a very full life, being interested in many things outside his strictly professional duties; he gained, indeed, a considerable reputation as a general sanitarian at a time when the organization of public health work was still in its infancy.

Thomas Pridgin Teale, who was born at Leeds June 28th, 1831, came of a surgical stock. His grandfather, Thomas Teale, was a practitioner of much repute and success in Leeds, and his father was Thomas Pridgin Teale, F.R.C.S., F.R.S., who married Frances, daughter of the Rev. Charles Isherwood, some time Fellow of Magdalen College, Oxford. Thomas Pridgin Teale the elder was born in 1801 and died in 1867. He was one of the founders of the Leeds school of medicine, and lecturer there for twenty years, chiefly on anatomy and physiology, and he was surgeon to the Leeds General Infirmary from 1833 to 1864. It was he who devised Teale's operation for amputation with a long anterior and short posterior rectangular flap (1853); the plastic operations in the treatment of cicatricial disfiguration of the face after burns; and a method for dealing with a torn urethra. He was one of the first six Crown nominees to the General Medical Council.

Thomas Pridgin Teale, the subject of the present biographical sketch, was sent first to Leeds Grammar School; in 1844 he went to Winchester, and from there in 1849 to Brasenose College, Oxford. He graduated B.A.Oxon. in 1852, and M.B. 1856; he had taken the M.R.C.S. in the previous year. He was a medical student at King's College, London, but immediately after taking his degree was appointed lecturer in anatomy and surgery at the Leeds school of medicine; this post he retained until 1876. He became surgeon to the Leeds General Infirmary in 1864. There he established a very high reputation as a surgeon and teacher, and his retirement from the active staff in 1884 caused great regret. His chief surgical writings were on the treatment of diseases of the eye, and he delivered the Bowman lecture before the Ophthalmological Society of London in 1893 on the abandonment of iridectomy in extraction of hard cataract. He also wrote papers on the extraction of soft cataract by suction (*Ophth. Hosp. Reports*, 1864), and on atropine and mercury in acute iritis (Ibid., 1860). His chief contributions to general surgery were on the surgery of tuberculous glands of the neck, an inquiry in which he was associated with his life-long friend Sir Clifford Allbutt, who was for many years his medical colleague at the Leeds General Infirmary.

At the Annual Meeting of the British Medical Association in Leeds in 1889, under the presidency of Mr. Wheelhouse, Mr. Teale delivered the address in surgery, choosing as his subject "Detail in Surgery"; in it he described from his large experience some practical points he had found of much assistance in his own work. One thing on which he insisted was the importance of ligaturing an artery in two places before its division between the two ligatures. In this way he maintained that he got physiological rest of the artery and avoided secondary haemorrhage. He also recommended the use of Lister's sounds in preference to the older methods of treating stricture of the urethra, and had some advice to give on drainage of wounds and on the proper way to administer ether.

Teale, though primarily a surgeon, was a very important member of the public health section of the community of his day. Thus he was president of the health section of the Social Science Congress at Huddersfield in 1883, of the corresponding section of the British Medical Association at Liverpool in 1883, and of the Association of Sanitary Inspectors of Yorkshire 1888-9.

His best known work was, perhaps, that entitled *Dangers to Health: A Pictorial Guide to Domestic Sanitary Defects*. It was published in 1879. It ran into four editions by 1891 and was translated into French and Spanish, and by H.R.H. Princess Christian into German. The book was really an elaboration of a lecture delivered before the Leeds Philosophical and Literary Society in 1877. He had come to the conclusion through his own professional experience that probably one-third, at least, of the incidental illness of the kingdom, including much of childbed illness and some of the fatal results of surgical operations in hospitals and private houses, was the direct result of drainage defects, and that they could and ought to be prevented. He felt sure that the medical profession were, as a general thing, lamentably ignorant about house sanitation and probably lived in badly drained houses themselves, and his object was to stir up public feeling on this most important subject. The lecture was delivered by request six times in Leeds and twice in neighbouring towns. The interest taken in the lecture and the discussion to which it gave rise taught Teale that if proper domestic sanitary arrangements were to be obtained the public must be educated in details of domestic sanitary matters, and should be shown the absolute necessity for good workmanship as well; the best way to drive these points home was to show the people in a simple, sympathetic, and unmistakable way the faults of sanitary construction which it is within the power of landlord and tenant as distinct from the public authorities to remedy and avoid. The design, therefore, which he set before himself in writing his book was to represent pictorially every important fault to which domestic sanitary arrangements are liable, and to do this in the most forcible way irrespective of correct drawing. The points in each of the fifty-five plates to which it was desired to attract attention were drawn in strong lines so that the eye might fix upon them first, and the other lines more faintly. The course and escape of sewer gases were indicated by blue arrows, and escaping sewage was also coloured. The whole effect of the drawings is very striking even now, and the book must have had a very remarkable influence at the time in arousing public interest in such a highly important subject.

In addition to hammering sanitation of this kind into the public, Teale gave his views on ventilation. As sanitation should begin at home, or, to change the metaphor, as a doctor should grease the wheels of his own wheelbarrow before telling another person that his squeaked, Teale's first chapter on ventilation was concerned with a window ventilation in the roof of a doctor's brougham. He had had one, a hinged window opening backwards, in the roof of his carriage for some ten years and recommended it strongly to his medical brethren. They would get pure air, without a draught, and light for reading; from this the transition to the proper ventilation of houses was easy. The system he adopted in his own house and recommended for use in others was to place a Tobin's tube with sectional area about equal to that of the chimney pot in each room because air must be provided to go up the chimney. The next question was how to clean the air and exclude the dirt. He had long seen that if air was to pass through a screen without retardation of current the area of the screen must be fifteen to twenty times that of the section of the Tobin tubes which it supplied. He therefore carried his tubes from the cellar through the floors to the various rooms with inlet of air in the cellar and large screens in the ceiling of the cellar supplying his tubes. There were, however, manifest inconveniences in such a method, so he asked the tube makers to try and screen the air in the tubes, the screen to be at least ten times the area of the section of the tube and the section of the tube to be equal to the section of the chimney pot. This was done by putting the screen in the tube diagonally from top to bottom. In subsequent editions of his book the tubes were brought within more reasonable limits of space.

Other pieces of popular writing were the address which he delivered as president of the health section of the Social Congress at Huddersfield in 1883, on "Hurry, worry, and money—the bane of modern education"; a pamphlet on the economy of coal in house fires published in 1866; and a lecture on the principles of domestic fireplace construction, delivered at the Royal Institution in 1886. The titles of these are sufficient clue to their subject-matter.

He was elected a Fellow of the Royal Society in 1888 and made Honorary D.Sc.Leeds in 1904. He was a Crown Representative on the General Medical Council from 1876 to 1901.

He married first, Alice, daughter of the Rev. W. H. Teale; she died in 1891; and secondly, Jeannie, daughter of D. C. Jones, Esq., of Tamworth. He leaves four sons and four daughters. One of the sons carries the medical instincts of the family into the fourth generation.

DAVID W. FINLAY, B.A., M.D., LL.D., F.R.C.P.,

Emeritus Professor of Medicine in the University of Aberdeen.

DR. DAVID WHITE FINLAY, whose death at "Balgownie," Helensburgh, on November 4th, we regret to record, was Regius Professor of the Practice of Medicine at the University of Aberdeen for over twenty-one years.

He was born in Glasgow eighty-three years ago, and was educated at Glasgow High School and Glasgow University, where he graduated B.A. in 1860 and M.D. (with commendation) in 1864. He took the D.P.H. of Cambridge in 1883, and was elected F.R.C.P.Lond. in 1885. He also studied for a time in Vienna. For some years he held the appointment of physician to the Middlesex Hospital, and was lecturer on clinical medicine, forensic medicine, and public health in the medical school. He was also physician and afterwards consulting physician to the Royal Hospital for Diseases of the Chest in London. In 1891 he was appointed Regius Professor of the Practice of Medicine in the University of Aberdeen, and physician to the Aberdeen Royal Infirmary. He was appointed Dean of the Faculty of Medicine in 1907. When in 1912 he retired from the chair he became Emeritus Professor, and the University afterwards conferred upon him the honorary degree of LL.D. He took a keen interest in the affairs of the University, and in 1900 he represented it at the bicentenary celebrations of Yale University, where he received the honorary degree of LL.D. In 1908 King Edward VII appointed him one of his honorary physicians in Scotland, and in 1911 King George V conferred a similar honour upon him. He was the representative of the University of Aberdeen on the General Medical Council from 1901 to 1911. He contributed many articles to the medical journals and to the transactions of medical societies, and he was the author of the article on pneumothorax in Allbutt's *System of Medicine*. During the war he held the rank of temporary lieutenant-colonel R.A.M.C., and was in charge of the Scottish National Red Cross Hospital at Bellahouston, Glasgow.

His chief recreation was yachting, on which he was a recognized authority, and he published several works on the subject, including, in 1910, *Reminiscences of Yacht Racing and Some Racing Yachts*. He was a member of the first council of the Yacht-Racing Association and of the Royal Clyde Yacht Club and other yacht clubs. He married a daughter of the late Mr. Stephen Thompson, shipowner, of London, and had two sons and four daughters.

We are indebted to Dr. ASHLEY MACKINTOSH, the present Regius Professor of Medicine in the University of Aberdeen, for responding to our request for a tribute to Professor Finlay's memory, as follows:

I shall always be glad and proud to think that I was a pupil and, later, a colleague of Professor Finlay. When he was appointed Regius Professor of Medicine at Aberdeen in 1891, it was felt to be no little gain to have secured a man who was a graduate of another Scottish university and had already gained considerable experience of medical practice and teaching in a great London medical school. And the result justified the expectation.

As a teacher he was eminently careful, lucid, and direct. His systematic lectures were illustrated and amplified by a series of excellent lantern slides. In his clinical teaching he followed largely the Socratic method of question and answer, and his students quickly learned that a straight question demanded a straight answer—nothing else would satisfy our teacher. By example, as well as by precept, he taught the necessity of following Sydenham's "method" of careful, close, continued observation of diseases. He insisted on accuracy—"the old Hippocratic ἀκρίβεια"—in his students as in himself; he could tolerate almost anything rather than slipshod work. And if, at times, interest did appear to be sacrificed to detail, this was surely a fault in the right direction in a teacher. Through all his work he had the saving grace of quiet, dry humour, and his students knew that he took a keen and living interest in them and their welfare. He was a loyal supporter of the movement to secure a better arrangement of hours for clinical study at the infirmary. I can testify that his interest in his old students and in the university generally was fully maintained up to the end of his life.

As a man and friend, Professor Finlay was loyal, downright, and sincere; he did his work and said his say without fear or favour. When he retired in 1912, Aberdeen University lost a distinguished professor and teacher, a sound and wise counsellor. His death will leave in the hearts of his former pupils and other attached friends a sense of very real loss. I can never forget his uniform kindness, thoughtfulness, and courtesy and how very much I owe to him.

We are glad also to be privileged to publish this eloquent note on Professor Finlay's sterling qualities as a man:

"Ane by ane, they gang awa'," as George Macdonald has it in his beautiful line, and the medical profession is the poorer by the passing of David Finlay, a true Scot, a man of sterling worth, and a steadfast friend. One of the old school, he had all the courtesy and repose of the Victorian—a noticeable and pleasing feature in these hectic Georgian days. Upright and honest to a fault; a hater of side, sham, and shoddy; ever imbued with a high sense of duty; constant to the task in hand; meticulous in detail, and somewhat impatient of the working of minds less well ordered than his own; a man of firm determination, and to some stern, but to those who knew him rich with the milk of human kindness and endowed with a keen sense of humour—such was "Dauvit," as he was affectionately called by a generation of students. To his sterling work at Marischal College and in his wards at the Royal Infirmary, a competent authority will bear testimony. As Emeritus Professor he continued to take an active interest in the Aberdeen Medical School, and on leaving the Royal Infirmary he presented a large number of medical books and periodicals as a reference library for the resident staff. From the Silver City by the Sea he went to Glasgow, and thence to Helensburgh, where from his house of Balgownie—a name redolent with memories of Aberdeen—he could look out upon the well-kent waters of the Firth of Clyde, for he had ever felt the fascination of "the many-sounding sea," and on the title-page of his interesting book, *Reminiscences of Yacht Racing*, had inscribed Byron's lines, which might well have been written of himself:

> "And I have loved thee, Ocean! and my joy
> Of youthful sports was on thy breast to be
> Borne, like thy bubbles, onward; from a boy
> I wanton'd with thy breakers—they to me
> Were a delight. . . ."

He and his brothers from their youth upwards had been fond of boating, and had owned and raced many yachts on the home waters of the Clyde and elsewhere. One of these, the *Kilmeny*—a prominent picture on his study wall—was described by an authority as "by far the best boat of her inches ever built," and "for a combination of speed and power the best craft that Fife ever turned out." When the "excitements and striving" of racing gave place to "the more sober, but still pre-eminently satisfying and health-giving pleasures of cruising," he sailed his yacht among the Western isles, and wrote eloquently of the beauties of Skye, of the hills of Mull and Morven, and of the cliffs of Rum—scenes which appealed strongly to his sense of the picturesque, and remained with him an imperishable memory. Seascapes were his favourite pictures, and of these he had many, while enlarged photographs of white-winged yachts sailing on waters havened by Highland hills covered the

walls of his study. Most of these were his own work, for he was an expert in artistic photography.

When the war clouds darkened his retreat he took service, at the age of 75, in a naval hospital on the Clyde, and later became lieutenant-colonel and O.C. the large Scottish Red Cross Hospital in Bellahouston Park, Glasgow. There he did excellent work, but occasionally found the trivialities and circumlocutions of the War Office rather trying, and the twistings and twinings of red tape foreign to his methods. For one to whom it had almost been a religion to "call a spade a spade" it was somewhat difficult to understand why it was an offence not to style it "Shovel, Army, Field Pattern Mark 1," or why rank should be regarded as anything but just "the guinea's stamp." But he did his bit and saw it through; and retired to Helensburgh, where he spent the evening of his days in his garden and among his books, happy in the society of his wife and family, ever interested in medical affairs, busy with his carefully arranged records and papers, and in active correspondence with his friends in Aberdeen, whose medical school was often in his thoughts.

During his early years on the Clyde, his busy practice in London, and his twenty-one years of professorial work in Aberdeen, he led a strenuous and useful life, and retired full of years and honours, admired by many and respected by all. Even when well into "the borrowed years" he bore the growing burden of his age manfully, and still keen and alert did the work that fell to his hand, till at the sunset, with his eyes set towards

> "The dim, dark sea, so like unto Death
> That divides and yet unites mankind,"

there came to him "the one clear call," and he "put out to sea."

J. S. R.

WILLIAM HARRISON CRIPPS, F.R.C.S.,

Consulting Surgeon to St. Bartholomew's Hospital.

By the death of Mr. Harrison Cripps, the medical profession loses a surgeon who, in his younger days, was one of the great pioneers of the successful surgery of the abdomen and rectum in this country.

Born on January 15th, 1850, of an old Gloucestershire family, William Harrison Cripps was the second son of Henry William Cripps, Q.C., sometime Recorder of Lichfield, and Julia, the eldest daughter of Charles Lawrence. One of three sons, all, as their careers in after life have shown, of very exceptional ability, Cripps would have risen to the greatest eminence in any profession he had cared to take up. Henry, his eldest brother, was a prominent member of the Parliamentary Bar; his younger brother is Lord Parmoor. He received his medical education at St. Bartholomew's Hospital, and obtained the M.R.C.S.Eng. diploma in 1872. He was immediately appointed house-surgeon and continued on the active staff of the hospital until, as the senior surgeon, he resigned in 1909 and became one of the consulting staff. He became a Fellow of the Royal College of Surgeons in 1875. After serving in the Medical School as demonstrator of anatomy, he was appointed surgical registrar in 1879, and was elected an assistant surgeon to St. Bartholomew's in March, 1882. It was during the later period of his time as assistant surgeon that Cripps attained the zenith of his fame both as an operator and as a teacher, and many generations of old Bart's men still remember and appreciate his famous and humorous teaching in the out-patient room. As a monument of his kindness of heart and ever-readiness to help his juniors, the memory of those gratuitous classes, which he took in the evenings at his own house, will ever remain in the minds of his old pupils.

In 1892, whilst still in the out-patient department, he was appointed surgeon to the women's wards, at that time in the care of Sir Francis Champneys. This rather specialized branch of abdominal surgery seemed dearer to Cripps's heart than his general work, and for many years he filled rather a curious and anomalous post with the greatest success. Much of it was undoubtedly due to the mutual feelings of admiration and real affection with which he and Champneys regarded one another. In January, 1902, on the resignation of Alfred Willett, he became a full surgeon to the hospital. From 1880 to 1890 he had served as surgeon to the Great Northern Hospital and the Royal Free Hospital. He practised as a consultant in Stratford Place, W., devoting himself more especially to the surgery of the abdomen and rectum.

For his monograph on *Carcinoma of the Rectum* Harrison Cripps was awarded the Jacksonian prize by the Royal College of Surgeons of England in 1876. Great credit is due to Cripps for his strong advocacy at that time of the operation of inguinal colostomy, both as a palliative measure and as a preliminary to the extensive perineal and trans-sacral excisions which he favoured. His work was done before the days of the combined abdomino-perineal methods, and it is interesting to note that modern surgical teaching is rather inclined to revert to those operations, which, in his capable hands, gave such excellent results. He was elected to the Council of the Royal College of Surgeons in 1909, served as a member until 1920, and was vice-president for the years 1918 and 1919. He served on the Finance Committee, in which capacity his remarkable business acumen was of the greatest assistance; he was also a representative of the College on the executive committee of the Imperial Cancer Research Fund.

Among his better known writings are *Ovariotomy and Abdominal Surgery*, published in 1898; *Cancer of the Rectum: The Possibility of Extirpation*, the fifth edition of which appeared in 1913; and *Diseases of the Rectum and Anus*, fourth edition, 1913. At the Annual Meeting of the British Medical Association at Liverpool in 1912 he opened the discussion on the surgical treatment of rectal cancer. In view of the present-day teaching of the value of temporary caecostomy in some cases of obstruction, an article of his entitled "Temporary typhlotomy for intestinal obstruction," published in the BRITISH MEDICAL JOURNAL in 1893, is especially interesting.

Always a strong man, and confident of his ability to carry out his own virile ideas, Cripps may occasionally have wounded the more tender susceptibilities of some of his colleagues, but, concealed beneath a cynical exterior, lay a great and kind-hearted personality. A man of many parts, perhaps his sense of humour will remain in the minds of his friends as one of his stronger attributes, and this happy trait he retained even up to the final day of his last illness. To his simplicity of technique, his gentleness in the handling of tissues, and the sound and careful organization of the many details of an operation must be attributed much of his success as a surgeon. Cripps always knew what he wanted to do and did it in the simplest, quietest, and most gentle manner without one unnecessary or purposeless movement. Possessing a great fund of knowledge on many subjects, he was a brilliant and interesting conversationalist, whose like is seldom met with in the present day. In brief, it may be said of him that he was a great autocrat, a fine surgeon, and a good sportsman—than which no higher praise is possible.

H. W. W.

Sir FRANCIS CHAMPNEYS, Bt., writes: Having been asked to send a contribution to the obituary notice of Mr. Cripps, I gladly do so. I only knew him well after my return to St. Bartholomew's on the death of Dr. Matthews Duncan. In accordance with custom, the physician-accoucheur, who was answerable for all cases admitted to his wards, asked for the help of one of the surgeons to do such operations as he desired to assign to him. These operations were specified by me as abdominal sections, except Caesarean sections, and were performed by Mr. Cripps for many years. All human beings are very compound, and this mixture tends to make individuals interesting as well as puzzling. Cripps had at least three well marked strains: there was the surgeon, the domestic individual, and the very keen man of business. It was with the two first that I was best acquainted. Others will speak of him as a surgeon with more authority than I; but I saw so much of his work in my special department that I do not think that anyone had better means of judging it. Cripps was a born surgeon. As regards an opinion, the importance of facts fell naturally into proportion in his mind, and he was generally right. As regards operative work, he was rapid without being hurried; he had beautiful "hands," firm and gentle; he was absolutely concentrated

on his work, never flurried, always unruffled and prompt in the face of a mishap. In the subsequent management of a case he was never out of the way in case of emergency unless (as when called away) he had made ample provision; in short, his patient was able to feel that she was never out of his mind until she was well. As regards his non-professional side, he was an unusually kind and sympathetic friend, in joy or in sorrow. In the holidays, when his delight was to fish, he always took care of his guests first, and put himself last. There was another side of him which was known only to very few, and to which he never referred to me—namely, his care for his poorer patients. It was his wont to follow their fortunes on their discharge from hospital, and to help pecuniarily those who needed help, his reason being that, as they had helped him indirectly to prosperity, it was only fair that they should not be forgotten.

Mr. F. R. Cross, surgeon to the Bristol Eye Hospital, and reader in ophthalmology in the University, writes:

My friendship with Harrison Cripps dated from the time that we were fellow residents in King's College Chambers. He was in the engineering department, and would no doubt have done well, as he had a mechanical turn of mind and showed ingenuity in the invention of instruments—one that was exhibited at the Royal Society on the "continuous registration of heat," and others.

Yet he was drawn towards surgery, became a student at St. Bartholomew's, rapidly qualified, and was demonstrator of anatomy. His natural ability and industry were aided by a quiet self-confidence that always characterized him. Thus almost directly after he passed the examination for the Fellowship of the College of Surgeons he gained the Jacksonian prize for an essay on "Cancer of the rectum and its cure by excision." This was followed by a book that started his successful career in this branch of work: it was illustrated by many drawings by Mrs. Cripps and himself taken from microscopical sections he had made from his cases. But more than this, he was a good all-round surgeon and teacher. Perhaps not a man of many friends, he was very sociable, and hospitable to those he knew well. He was a good shot and fisherman; and as a younger man he enjoyed what time he could give to a day's hunting, particularly with his father's private pack of harriers near Parmoor. Later on, when he took a lease of Abbotsford, the house was, during the long vacation, filled with his friends for whom he found daily amusement on the grouse moors, or in salmon fishing in the Tweed. His hospitality was unbounded—his great care seemed to be to think for the individual interests of his many guests, leading the way in sport by day, and in the evening keeping us all together, by cheery conversation at dinner or by the fireside. This hospitality was continued year by year, and afterwards when he purchased Glendaruel in Argyllshire.

In 1905 he was elected to the Council of the College of Surgeons as a substitute member for three years, but was not re-elected. With characteristic courage, however, he tried again in 1909, was successful, and remained a member until 1920. He was well fitted for the independence that characterizes the actions of the members of Council; while his long experience as a hospital surgeon, his sound common sense and knowledge of business, were of great service. I look back with pleasure to the times I spent with him and many of our friends, and with gratitude to Cripps and Mrs. Cripps for hospitality in London and Abbotsford, and later when he became the Laird of Glendaruel; there it is that he is lying now in peace, surrounded by the valleys and mountains that he loved so well.

THOMAS HENRY GREEN, M.D., F.R.C.P.,

Consulting Physician to Charing Cross Hospital and to the Hospital for Consumption and Diseases of the Chest, Brompton.

The death of Dr. Thomas Henry Green on November 5th in his eighty-second year removes one who loyally served Charing Cross Hospital Medical School for thirty-five years; for no less than twenty-eight years of that period he was physician to the hospital. He was educated at University College Hospital, became M.R.C.S. in 1864, M.B.Lond. in 1865 with first-class honours in medicine, and proceeded to the M.D. in 1866. After holding various posts at University College Hospital and that of medical registrar at the Hospital for Sick Children, Great Ormond Street, he was in 1868 elected assistant physician to Charing Cross Hospital; this migration from University College to Charing Cross Hospital was imitated in 1871 by Sir R. Douglas-Powell and the late Dr. Vivian Poore, and in 1876 by Sir Thomas Barlow. From 1874 to 1902, when he retired and became consulting physician, he was full physician, and the excellence of his clinical teaching will long be held in grateful remembrance by many generations of old students of the hospital, who, it is said, found it unnecessary to read any textbook of medicine for examinations provided they attended Green's clinical teaching. As lecturer on pathology and morbid anatomy he set a high standard of teaching from the time he joined the hospital staff until 1887, and from 1870 to 1874 he was in addition curator of the museum.

At the Hospital for Consumption and Diseases of the Chest, Brompton, he was elected on June 17th, 1875, together with his colleague at Charing Cross Hospital, Dr. J. Mitchell Bruce, assistant physician, becoming physician in December, 1888, and consulting physician in February, 1903. He became a member of the Royal College of Physicians of London in 1867 and a Fellow in 1874, and was Censor (1900-1), Senior Censor (1904), Councillor, and for eight years an examiner. At the time of his death he was sixth in seniority on the list of Fellows.

Green was a representative hospital physician of the best contemporary type with a solid basis of morbid anatomy for his clinical practice. Of a retiring disposition he was seldom in evidence, and less so in the later part of his professional career, possibly as the result of a serious illness from which he made a complete recovery, than in his earlier days. At the old Pathological Society of London he was secretary (1875-6), vice-president (1886-8), and served twice on the Council (1871-3, 1878-9). He was also on the Council (1886) and a referee for papers (1882-1906) at the Royal Medico-Chirurgical Society, and when the Royal Society of Medicine started he was one of the first vice-presidents (1907-8) of the Section of Medicine. He also served on the Council and made four contributions to the *Transactions* of the Clinical Society of London. From comparatively early days he was widely and chiefly known as the author of *An Introduction to Pathology and Morbid Anatomy* which first appeared in 1871 (12mo, pp. xvi and 304; 60 figures) and has now passed its jubilee in the much expanded thirteenth edition under the direction of Drs. W. C. Bosanquet and G. S. Wilson (1923, 8vo, pp. 624; 244 figures). Embodying the teaching of Virchow, under whom Green had worked, it was rightly regarded by students as a standard textbook and was translated in 1876 and again in 1886 into Japanese. After Green gave up the pathological lectureship the handbook was edited by a succession of his colleagues; the edition of 1889 was brought out by the late Mr. Stanley Boyd, who was followed by the late Dr. Montagu Murray, and then by Dr. Bosanquet, who in 1917, in conjunction with Professor W. W. C. Topley, was responsible for the twelfth edition.

In 1876 he published a small book of 103 pages on *The Pathology of Pulmonary Consumption*, which consisted of three lectures given in the previous year at the Brompton Hospital. This contained illustrations from his book on pathology and expressed views originally put forward four years previously in a series of papers in the *Medical Times and Gazette*. Quain's *Dictionary of Medicine* contained an article by him on inflammation of the lungs, and he made various, but by no means numerous, contributions to the medical journals.

This bare record shows the events in the life of a conscientious physician who was content to do the day's work without any further ambition than to have earned his own self-respect.

HENRY WHITBY PHILLIPS, M.D.,

Croydon.

Henry Whitby Phillips was a son of the late Charles Phillips of Atherstone, Warwickshire, and a brother-in-law of the late Dr. G. A. Gibson of Edinburgh. He studied at Edinburgh, and graduated M.B., C.M. in 1881. He took the diploma of M.R.C.S.Eng. in the same year.

Shortly after graduation he became house-physician to the late Dr. George Balfour in the Royal Infirmary, Edinburgh. After holding various other hospital appointments he graduated M.D. with honours in 1886. He then settled in Croydon, where he rapidly established himself in an extensive practice, and remained for thirty-four years. During the war he served as an officer of the Volunteer Force, in the Surrey Royal Army Medical Corps, and was granted the honorary rank of major, receiving on retirement the thanks of the Army Council. He was also on the staff of the Croydon War Hospital, and was latterly entrusted with the organization of a volunteer ambulance corps. Not content with this he made several attempts to serve overseas, and the fact that he was prevented from going abroad by the age regulations and on account of medical reasons was a great disappointment to him.

In the midst of a busy life he found time for many interests. He was a member of the Alpine Club and a skilful and intrepid climber, and year after year he spent his holidays among the mountains, and had ascended many of the more inaccessible peaks in the Swiss and French Alps. Though the loss of an eye, supposed by some to have been due to several attacks of snow blindness, prevented him from continuing to indulge in his favourite hobby, he still kept up his interest. He was an enthusiastic member of the Pepys Club, and was actively interested in several literary and art societies. Believing to the fullest extent that a medical man should be well instructed and well read, amid the wide circle of his interests he kept himself fully abreast of the recent advances in medicine and surgery. In the company of a sympathetic listener he was at his best in his Alpine garden on a summer evening, pointing out his most choice and favourite specimens and telling tales of his beloved mountains; or, wandering through the dim twilight of one of our ancient cathedrals, delighting his audience with his profound knowledge of religious architecture. Those who met him quickly recognized him as a man of great enthusiasms and wonderful versatility, of broad views and independent thought, a lover of all things beautiful, whether the work of nature or of man. Those who were privileged to know him intimately remember him as kindly and gentle, more especially to those most needing his assistance, preserving through his life the same high ideals with which he first set out on his journey, and supporting through the later years of his life an ever-increasing ill health with indomitable fortitude and without complaint.

The late Dr. William Hall of Leeds.—In response to our request Sir James Crichton-Browne has sent the following brief note: "I have seen nothing of the late Dr. William Hall of Leeds for forty years. While resident in the West Riding I met him many times in consultation, and found him a wise, broad-minded, and thoughtful physician, sympathetic and judicious and of refined and genial presence. He took an active part in the campaign against overpressure in elementary schools and the pernicious system of payment by results, and shamed us by his demonstration of the superior hygienic conditions under which Jewish children are reared. He was a delightful friend, a worthy member of the shining professional hierarchy in Leeds in those days."

Dr. Henry Lionel Smith, of Mottingham, Eltham, who died in a nursing home at Blackheath on November 3rd, aged 80, had had a much more varied experience than falls to the lot of most men of his profession. He was the eldest son of the late Henry Joseph Smith, F.R.C.S.I., of Donaghmore House, Queen's County, Ireland, was educated at the Ledwich School, Dublin, and took the L.R.C.S.I. and L.K.Q.C.P. in 1866, and the M.R.C.P.I. in 1885. He began his career in the service of the Hudson's Bay Company, when he was stationed at Moose Fort, at the southern end of Hudson's Bay; he then went to Australia, where he was for some time district surgeon at Albany, West Australia; and finally served in South Africa, where he was surgeon to the Mashonaland Police; saw active service in the Mashona rising, and received the medal for that campaign; afterwards he held the posts of district surgeon and M.O.H. at Bulawayo, the capital of South Rhodesia.

The well known bacteriologist and hygienist, Dr. Karl Flügge of Berlin, has recently died, at the age of 75.

Professor Friedrich Martius, formerly director of the Rostock University Medical Clinic, and a well known writer on achylia gastrica and the relation of heredity and constitution to pathology, died recently, at the age of 73.

The Services.

DEATHS IN THE SERVICES.

Colonel Sinclair Westcott, C.B., C.M.G., A.M.S. (ret.), died in Queen Alexandra's Military Hospital, Millbank, on November 6th, aged 64. He was born at Plymouth on February 23rd, 1859, educated at St. Bartholomew's Hospital, and took the M.R.C.S. in 1880, and the L.R.C.P.Edin. in 1881; he took the D.P.H.Dublin in 1899. He entered the R.A.M.C. as surgeon in 1882, he attained the rank of colonel in 1912, and retired on December 26th, 1917. He was medical officer of health at Hong Kong during the plague epidemic of 1895 in that colony, the first outbreak of the great visitation of plague which has ever since been more or less endemic in the Eastern hemisphere, and has ravaged India almost continuously since it was first detected in Bombay in 1896. He served in the South African war from 1899 to 1902, and took part in the defence of Ladysmith. Afterwards he was in charge of a general hospital, with the temporary rank of colonel, served in the operations in the Orange River Colony, was twice mentioned in dispatches, in Sir George White's dispatch of March 23rd, 1900, and Sir Redvers Buller's of November 9th, 1900, both published in the *London Gazette* of February 8th, 1901, and again in the *London Gazette* of September 10th, 1901. He received the Queen's medal with three clasps, and the King's medal with two clasps, and the C.M.G. In the war of 1914–18 he served first as A.D.M.S. of the First Division, and afterwards as D.D.M.S. of the First Army Corps, was six times mentioned in dispatches, in the *London Gazette* of December 4th, 1914, June 22nd, 1915, June 15th, 1916, and May 29th, 1917, and received the C.B. in 1915. He was also a Knight of Grace of the Order of St. John of Jerusalem. From 1918 to 1920 he served under the Ministry of Pensions as a deputy commissioner of medical services. In 1898 he married Ethel Constance, daughter of Colonel the Hon. Robert Bradshaw, and widow of D. Gifford Ottley, and leaves one daughter.

Colonel Geoffrey Craythorne Hall, Bengal Medical Service (ret.), died at Bexhill on October 27th. He was born at Grahamstown, South Africa, on August 27th, 1848, and educated at Guy's Hospital; he took the M.R.C.S. and the L.R.C.P.Edin. in 1871, and the F.R.C.S. in 1894. He entered the I.M.S. as assistant surgeon on March 30th, 1872, and attained the rank of colonel on December 2nd, 1901, but retired less than a year after. Before entering the service he had taken part in the Franco-German war of 1870–71, serving in a field ambulance, and received the German war medal. In India, after a few years' military duty, he entered civil employ in the North-West, now the United Provinces, and spent almost the whole of his service in the jail department of these provinces. For the greater part of the time he was superintendent of the large central jail at Naini, near Allahabad, but rose to be Inspector-General of Jails in the province. While at Naini he founded an ophthalmic hospital at Allahabad, kept up by private subscriptions, and for many years had a great reputation as an ophthalmic surgeon. He was the author of a number of small books on eye surgery—books which, without being very scientific, were of great help to the young civil surgeon beginning to do eye surgery in a district hospital remote from the help or advice of more experienced officers: *Causes of Blindness in India*, 1879; *Eye Diseases of Children*, 1884; *Complications of Cataract Operations*, 1886; *Senile Cataract*, 1899; *When to Wear Glasses*, 1900.

Medical News.

The new session of post-graduate courses and demonstrations for 1923–24, arranged by the Faculty of Medicine of the University of Sheffield, commenced on Friday, November 16th, and will be continued on Tuesdays and Fridays at 3.30 p.m., with the exception of a break from December 18th, 1923, till January 25th, 1924. The lectures will be announced in the weekly diary published in the Supplement.

We may remind readers that the lecture by Professor Strandberg of Copenhagen, on the results of treatment of rhino-laryngological tuberculosis by the Finsen light bath, will be delivered before the Royal Society of Medicine on Monday, December 3rd, at 5.30 p.m.

A report by the medical committee of the Canadian Social Hygiene Council on the standardization of the diagnosis and treatment of venereal diseases has been issued by the Department of Public Health at Ottawa. The committee consisted of thirty-five medical men and women under the chairmanship of Dr. Edmund E. King of Toronto, and the editorial supervision of Dr. J. J. Heagerty, chief of the Division of Venereal Disease Control in the Dominion

Department of Health. The report recommends that all laboratories, including university laboratories, doing Wassermann tests, shall be licensed by and under the supervision of the Provincial Board of Health, and urges private, university, hospital, municipal, and provincial laboratories, in the use of these tests, to adopt recognized methods, so as to approach uniform results for the purposes of comparative study.

THE memorial to the late Professor Sir German Sims Woodhead at the Cambridgeshire Tuberculosis Colony, Papworth Hall, consists of a new pathological laboratory and x-ray department. It will be opened on Thursday next, November 22nd, at 2.30 p.m., by the Hon. Sir Arthur Stanley, G.B.E. The hospital, hostels, workshops, and village settlement will be open to visitors from 2 to 4.30 p.m.

DR. GEORGE CHAPMAN, of Hall Green, Birmingham, has celebrated this month his 100th birthday. He was a member of the British Medical Association for forty-five years. The Lord Mayor of Birmingham has sent him a congratulatory letter.

THE Schörstein Memorial Lecture will be delivered by Dr. Gordon Holmes, C.M.G., in the Anatomical Theatre of the London Hospital Medical College, on Monday, December 3rd, at 4.15 p.m.; the subject selected is some symptoms of cerebral irritation.

THE Duke of Bedford (President) and the General Committee of University College Hospital are giving a dinner at the Savoy Hotel, London, on Tuesday next, November 20th, when H.R.H. Prince Henry will be in the chair. Further information can be obtained from Dr. Walter W. Seton, University College, Gower Street, W.C.

THE annual dinner of the London School of Tropical Medicine will be held at the Hotel Victoria on Wednesday, November 21st, under the presidency of Sir Ion Hamilton Benn, deputy chairman of the Seamen's Hospital Society and the School.

THE annual dinner of the Medico-Legal Society will be held at the Holborn Restaurant on Friday, December 14th, at 7 for 7.15 p.m., when the president, the Right Hon. Lord Justice Atkin, will be in the chair.

THE bi-annual dinner of the Aberdeen University Club, London, will be held on Tuesday, November 27th, at Gatti's Restaurant, with Lord Elphinstone in the chair. The principal guest will be the Right Rev. Professor G. Milligan, D.D., D.C.L. The hon. secretary, Dr. Anstruther Milligan, 11, Upper Brook Street, W.1, will be very pleased to hear from any past or present graduates, men or women, wishing to attend the dinner.

ADMIRAL OF THE FLEET EARL BEATTY will preside at a festival dinner in aid of the Royal Northern Group of Hospitals to be held at the Mansion House on Wednesday, November 21st, at 7.30 p.m. The particular object of the dinner is to help to reopen seventy beds now closed.

AN exhibition of scientific novelties will be held at King's College during the Christmas holidays, from December 29th to January 9th inclusive, between the hours of 2 and 9 p.m. Experiments and demonstrations will be given continuously during this period and illustrated lectures will be delivered by Professor Cheshire, Professor Winifred Cullin, Sir Richard Gregory, and others. The proceeds will be given to the King Edward's Hospital Fund for London.

THE annual meeting of the Medical Officers of Schools' Association will be held at 11, Chandos Street, W.1, on Thursday, November 29th, at 5.15 p.m., when Dr. H. Crichton Miller and Dr. H. C. Cameron will open a discussion on the nervous child.

IN his recent presidential address to the Bolton and District Medical Society Dr. John Johnstone surveyed the medical history of the town, dealing particularly with the characters of the medical practitioners who had lived in it. It was remarkable, he said, how many Bolton medical men had belonged to the same families, twelve families having provided thirty-four medical practitioners among them. In 1814 there were known to have been two medical men in Bolton, while at present there were eighty-five practitioners, including seven ladies.

SIR JAGADIS BOSE, F.R.S., director of the Bose Institute, Calcutta, will deliver a lecture at the Royal Society of Medicine on Thursday, December 6th, on assimilation and circulation in plants. The chair will be taken by the president of the Society, Sir William Hale-White, at 5.30 p.m., and the apparatus used will be demonstrated in operation.

DR. LOUIS C. PARKES will take the chair at a meeting at the Royal Sanitary Institute (90, Buckingham Palace Road, London) on Monday, November 26th, at 5 p.m., when Miss Muriel A. Payne, honorary secretary of the International School of Nursing and Child Welfare for Russia, will give an address on sanitary relief work in that country.

DR. LOCKHART STEPHENS, on his retirement from the post of medical officer of health for Emsworth, was entertained at a complimentary luncheon on November 6th, when he received a presentation from the members and officers of the Warblington Urban Council.

THE League of Remembrance was established to perpetuate the memory of the war hospital supply dépôt movement, which was so successful during the war. It maintains a supply of medical and surgical requisites and clothing for hospitals and other institutions engaged in the promotion of health or social welfare; it also provides financial assistance to the widows, children, and other dependants of officers who fell or were incapacitated in the war. The organization is maintained as a nucleus to be made available for mobilization or expansion in cases of national emergency, and it provides instruction by lectures in connexion with matter relating to the objects of the League. The headquarters of the League are at 1, Marlborough Gate, London, W.2, and include a dining room, club rooms, and work rooms. There are various classes of members, and subscriptions range from 2s. 6d. to 2 guineas.

A POST-GRADUATE course in oto-laryngology will be given in Vienna during the fortnight beginning Monday, December 3rd. Full particulars can be obtained from Dr. Kronfeld, Porzellangasse 22, Vienna IX.

THE seventy-fifth anniversary of the foundation of the Amsterdam Medical Society in 1848 was celebrated by a banquet and by an interesting historical loan exhibition. The Amsterdam Medical Society is now the Amsterdam Section of the Netherlands Medical Association.

AN institute for physical therapy and orthopaedics will be opened in Moscow in December.

IN New York, as in London, scarlet fever has shown a marked decrease this year. From January 1st to September 19th 6,832 cases have been notified, as compared with 8,622 cases during the corresponding period of 1922.

A CANCER INSTITUTE has been established in New York by the Commissioner of Public Welfare as part of the work of his department, and a series of clinical conferences of medical practitioners are to be held at which unusual cancer cases will be presented. The Institute is equipped for 200 patients.

UNDER the will of the late Elizabeth Skillern of Leyton, the London Hospital will, after payment of legacies, receive the residue of her property, which it is expected will amount to nearly £4,000.

THE Dutch Pediatric Society will hold its winter meeting at Amsterdam on November 25th, when the subject of empyema will be discussed.

JUPILLE, the second patient to be inoculated by Pasteur against rabies, has recently died. He held a post at the Pasteur Institute of Paris from its foundation until his retirement in 1918.

THE American Committee of Jewish medical practitioners has made a donation of £1,000 to purchase a piece of ground at Jerusalem for the erection of the medical faculty of the Jewish University.

A CONGRESS of tropical medicine was recently held at Saint Paul de Loanda in Portuguese West Africa on the initiative of the Portuguese Government; the subjects discussed were the organization of medical attention to the natives and the treatment of ankylostomiasis, malaria, sleeping sickness, etc. The next congress will be held in January, 1927, at Dakar.

A REGULATION has been passed by which every man and woman in greater New York who comes in personal contact with the public handling of food must obtain a licence from the department of health certifying that he or she is free from contagious and infectious disease; it is estimated that about 180,000 persons will require licences.

DR. C. v. PIRQUET has resigned the post of head of the department of pediatrics of the University of Minnesota, U.S.A., after holding it for two weeks, and has returned to Vienna. Dr. v. Pirquet stated that he had a feeling of homesickness for his Vienna hospital and was unable to adapt himself to the new conditions; moreover, the plans for a hospital, which were necessary for his researches, required a considerable time for completion.

IN Germany only 9 cases of small-pox and 22 of typhus occurred in the first six months of 1923, as compared with 199 and 358 respectively in the corresponding period of 1922.

THE sixteenth congress of the Russian Surgical Society will be held at Moscow from May 3rd to 8th, 1924. The subject for discussion will be pulmonary surgery, including abscess, gangrene, tuberculosis, and treatment of wounds of the lung. From January 3rd to 10th there will be a congress at Petrograd for pathology, experimental pedagogy, and psychoneurology.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

IN order to avoid delay, it is particularly requested that *ALL* letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology Westrand, London*; telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westrand, London;* telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Mediocra Westrand, London;* telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone, 4361, Central).

QUERIES AND ANSWERS.

INCOME TAX.

Wear and Tear of Car.

"D. W." has been advised by his accountant that he cannot claim any allowance for annual depreciation of his car by wear and tear, but is entitled only to deduct as a professional expense the cost of renewal as and when incurred.

*** The advice is correct. The distinction in this matter between a "trade" and a "profession" is inequitable, but is the legal result of the existing statutes. The Royal Commission on Income Tax recommended that the distinction should be abolished, but it still exists.

Renewal of a Car.

"G. C. H." is in disagreement with the inspector of taxes about the renewal of a car; the inspector refuses to take into account the fact that the cost of cars rose during the period covered by the use of the original car, with the result that when a better car was bought the *whole* of the cost was not attributable to the improvement which was effected by the transaction.

"J. W. H." also asks a similar question.

*** An official witness before the Royal Commission on the Income Tax gave two examples of an allowance for renewal of a machine—vide Volume I, page 68, of the Evidence. The first made it clear that a rise in cost would not carry any restriction of the allowance if a similar machine were purchased, and the second shows that where an improved and more costly machine is purchased the transaction is to be regarded as twofold—that is, renewal *pro tanto, plus* improvement. In "G. C. H.'s" case the facts form a combination of the two examples quoted and seem, therefore, to require the treatment that he claims.

LETTERS, NOTES, ETC.

THE ADMINISTRATION OF CHLOROFORM.

DR. J. T. MACLACHLAN (Glasgow) writes: If chloroform is to be administered safely and fearlessly, certain fundamental principles must be observed, as follows: (1) No two people are alike as regards their tolerance for chloroform; each has his or her safe dose. (2) In order to find out the safe dose, chloroform must be administered slowly, and the dose gradually increased until the patient is under. (3) When the patient is under, chloroform should be suspended, perhaps only for a few seconds; the art at this stage consists in giving from time to time just sufficient to maintain anaesthesia. If these fundamental principles are obeyed, no death should occur from chloroform. A Skinner's mask is preferable to a towel, which hides the face; some masks are too large. The mask selected should be divided by imaginary lines into four quadrants, and one of the lower quadrants should be selected on which to drop the chloroform. I believe if this simple rule is adopted it is not at all likely that an overdose will be given. If the patient coughs, it is a sure sign the chloroform is being rushed; the mask should be then lifted off the face for one inch or so for a few seconds. In the early stage of the administration it will be noticed that the patient's lips get rosy, and as long as they are so the anaesthetist may go ahead. Should they get blanched, chloroform must be instantly stopped, and ether dropped on the mask instead. A drop bottle containing ether must therefore be carried. The two accidents that may arise in the administration of chloroform, but which will not arise if the above rules are attended to, are asphyxia and syncope. Asphyxia gives timely notice; the patient gets blue. We must then stop the chloroform, pull out the tongue, lower the head, and slap the chest vigorously with a towel dipped in cold water, not forgetting artificial respiration. If syncope sets in there is no time for syringes or electricity. The proper thing to do is to invert the body suddenly by raising the table two or three feet, and getting the blood to rush to the head. The chest, especially over the heart, should be slapped violently with a wet towel. But these conditions should never arise.

ETHYL CHLORIDE–CHLOROFORM SEQUENCE.

DR. G. A. H. BARTON (London) writes: May I be allowed to reply to the queries of Dr. A. W. Burton (November 10th, p. 906) regarding the use of ethyl chloride as an induction agent? About 1904 I devised what I called the C.E.-ethyl chloride-chloroform induction sequence, and read and published papers on the subject, and later published a small monograph (*A Guide to the Administration of Ethyl Chloride*, H. K. Lewis and Co.) in which the method was fully described. Substituting ether for chloroform, I came to use the same sequence for open ether administrations. An account of this C.E.-ethyl chloride-E. sequence is given in a later publication (*Backwaters of Life*, H. K. Lewis and Co.). In 1912 Hornabrook (*Open Ethyl Chloride Anaesthesia*; Arbuckle, Waddell, and Fawckner, Melbourne) of Melbourne published some work he had done on somewhat similar lines, but the underlying principles differ. In my method (semi-open) a definite ethyl chloride narcosis is obtained, and it is during the "available" anaesthesia that this becomes merged into the permanent chloroform or ether narcosis. In Hornabrook's (purely open) method the aim is rather to bemuse the patient and stimulate his respiratory centre, thereby hastening the intake of chloroform. So far as I know only two textbooks allude to this induction sequence, and in both it is, or was, attributed to Hornabrook. Closed ethyl chloride followed by chloroform I tried originally and gave up as dangerous, and the same method was, I believe, practised and abandoned by Silk. It is probably this method that Gwathmey condemns. The semi-open method I use or the quite open one of Hornabrook is safe, certainly safer than a simple chloroform induction. I base this statement on an experience, including ether as well as chloroform cases, of nearly ten thousand inductions by my method.

DR. HAROLD SNAPE writes: I was anaesthetist before the war to the Manchester Children's Hospital, and for years, as a regular procedure, used an ethyl chloride-chloroform sequence or ethyl chloride-chloroform ether mixture sequence. I used a special inhaler consisting of a rubber bag connected with a plated tube bent at a right angle, its other end attached to a closed mask or facepiece; opposite to the straight piece of tube, leaving the bag, was a small shutter, which I opened to squirt the ethyl chloride into the bag and then shut. The inhaler was then ready for use and was applied till the child was under; it was then taken off and chloroform or chloroform-ether mixture administered on an open mask. By this means there was great saving of time and absence of struggling and excitement. I should not have continued with this method had it not been perfectly satisfactory. I would advise the chloroform or chloroform-ether mixture to be given very slowly to begin with as the breathing is so rapid and full with the ethyl chloride that unless this is fully realized an overdose is easily administered. I had one death with ethyl chloride alone in a case of tonsils and adenoids which I have not previously reported and which may be of interest. The patient was a boy, 12 years old, and after the operation was over came round, shouted, and sat up on the operating table and then collapsed and died. I diagnosed "status lymphaticus" as the cause of death, and the *post-mortem* examination proved this to be correct.

DR. H. J. VAN PRAAGH (London) writes: It may interest Dr. Burton to know that I started inducing with ethyl chloride early in 1917, when anaesthetist to the Cambridge Hospital, Aldershot, and that I have carried it out ever since. My technique is to spray 10 c.cm. ethyl chloride on to an open mask of six layers of gauze, and to follow it up with C.E., and finally open ether. In my opinion a closed inhaler should never be used. My colleague, Dr. Scott, I believe I am right in saying, used the same method. I have never had any trouble or anxiety with this procedure and find it a great saving of time, and a very pleasant method of induction from the patient's point of view.

VACANCIES.

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